CLIFFS OF THE NEUSE MASTER PLAN

Foreword

Cliffs of the Neuse State Park has served the people of North Carolina since 1945. Since its establishment, the facilities there have been gradually expanded in response to increasing park use; however, this use has now increased to such an extent that the facilities, land, and the main park feature itself — the cliff — are in danger of permanent damage. The capacity of the land to absorb recreation use and remain protected from degradation has been reached.

This Master Plan addresses these problems, analyzes them, and suggests both short-term and long-term development and management practices. The plan also recommends expansion of the recreation opportunities to reduce impact on the existing use areas. Designed for implementation in phases, the plan allows for uninterrupted park use and logical expansion of recreation facilities. The timing of development and construction is contingent upon the availability of funds and the establishment of biennial statewide priorities.

This Master Plan has been developed in depth and is an effort to provide a balance between recreation and natural elements. Therefore, future decisions which will affect Cliffs of the Neuse State Park must continue to reflect the principles and spirit of the State Park System.

CLIFFS OF THE NEUSE STATE PARK
MASTER PLAN

Prepared by:
The State of North Carolina
Department of Natural Resources
and Community Development
Division of Parks and Recreation
Master Planning Unit
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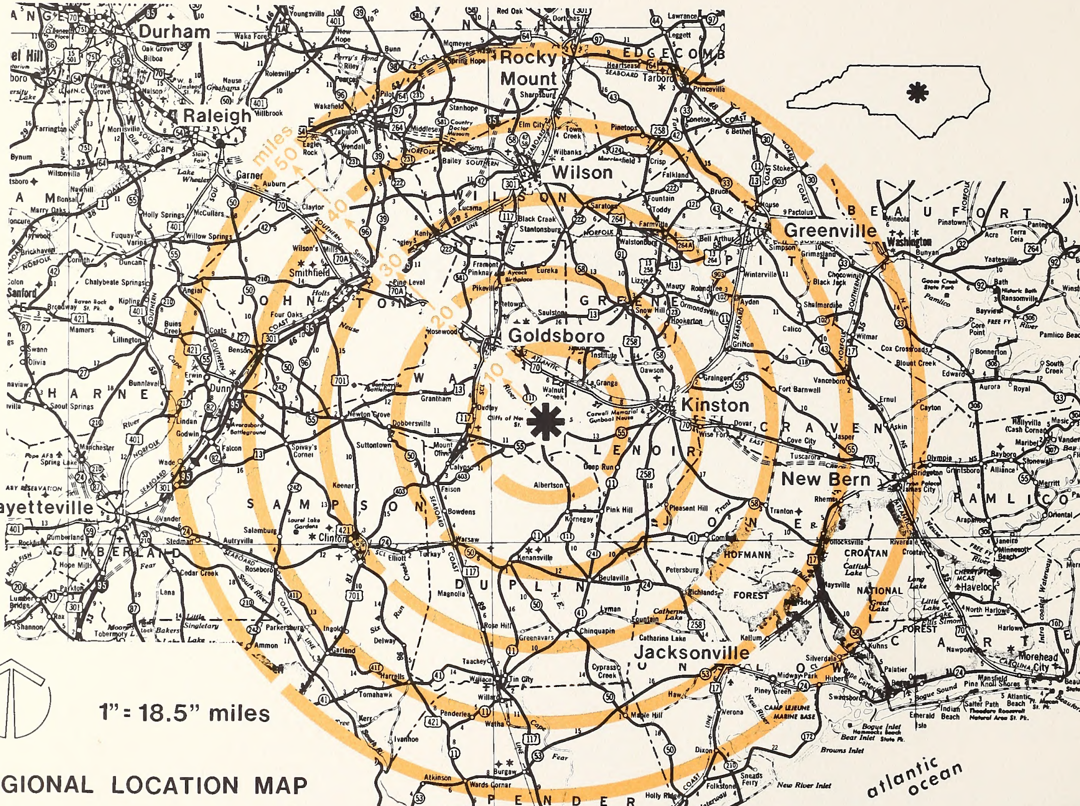

1" = 18.5" miles

REGIONAL LOCATION MAP

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CULTURAL RESOURCES

Location, Access, and Population

Cliffs of the Neuse State Park is located near the western limit of North Carolina's coastal plain, 13 miles south of Goldsboro. The principal access road in the region is Interstate Highway 95 which, running north-south through the State, passes about 35 miles west of the park. From the nearest access point on I-95 near Smithfield, Cliffs of the Neuse is about a 45-minute drive. The main east-west highway in the region is U.S. Highway 70 which runs from Morehead City, in the east, through Kinston and Goldsboro toward Raleigh. From points east and west, U.S. 70 is the principal access to the park. As it passes by the park site it carries an average daily traffic volume of about 8,200 cars. U.S. Highway 117, which originates in Wilson, runs south to Wilmington and carries an average of 6,000 cars daily as it passes ten miles west of the park. As it relates to the park, U.S. 117 is a more direct north-south access than I-95.

N.C. Highway 111 is the road actually servicing park access. Originating in Goldsboro at U.S. 70, N.C. 111 is also accessible from N.C. 55 via U.S. 117 south of Goldsboro and U.S. 258 at Kinston. Approximately 1,400 vehicles use N.C. 111 daily past the park.

Approximately 722,600 people, or 13 percent of the State's population, reside within 50 miles of the park. One-third of these reside in Wayne, Pitt, and Onslow Counties. The primary population centers in the area include Goldsboro, Greenville, and Kinston. In Onslow County, the military personnel at Jacksonville represent a major component of the population.

History

The first Indians arrived in the Wayne County area approximately 10,000 years ago, concluding a lateral migration across the United States from the Rocky Mountains to the Atlantic Coast. These were the first of the Tuscarora Indians in eastern North Carolina. They farmed and utilized the bow and arrow, never progressing to the development of the wagon wheel or an alphabet. The Tuscaroras after the time of Christ were great hunters and reputed to be ferocious warriors.

The first surveyor to arrive in the Wayne County area, John Lawson, found the Tuscarora lands bounded on the north by the Pamlico River, on the south by the Neuse River, on the west by Smithfield and on the east by Kinston. Because of trading difficulties with the white settlers and the encroachment on the heart of their nation around the Neuse River, the Tuscaroras carried out a secret attack on the settlers in September, 1711. Lawson, who befriended the Tuscaroras in the Wayne area in 1700, became the first victim of their wrath a decade later.

The Indian villages of the Wayne County area were located primarily near a permanent stream, high ground and sandy soil. The high ground provided protection from floods and allowed a good view of potential enemies. The sandy soil was chosen because it was easier to clear for farming with crude stone axes. Also, the vegetation did not grow back as fast as it would in rich, fertile soil. Remnants of Indian villages or campsites can be found in many parts of Wayne County where these three factors exist.

The community of Seven Springs, considered by many to be the oldest in Wayne County and known in its early days as Whitehall, received its first public notice from John Lawson, who recorded trading cabins and white traders in the area. Although the area was generally considered Tuscarora Indian territory, local historians believe that Soponie Indians built the village across the river from present Seven Springs and maintained a campground near one of the natural springs in the area.

Despite the reported existence of early traders along the Neuse River in the Seven Springs vicinity, Wayne County records indicate that William Whitfield, II, was the first permanent settler of the Whitehall community, and the one responsible for that

name. Following the Revolution, the settlement at Whitehall began to grow, influenced by the stage coach line which passed through the area and the increased river traffic. Some industry developed in the small community, but for the most part its residents were then, as they are today, busy with agriculture. There was, however, a buggy factory, a turpentine distillery, a brick works and several warehouses in the town itself. On the site of the old Indian campground, there was also a government-operated whiskey distillery and a blacksmith's shop.

Years later, when the Civil War began, Whitehall became the site of a Confederate shipyard and some say the Confederate Ram Neuse was built there. On December 15 and 16, 1862, the battle of Whitehall was fought and the small town was virtually destroyed. The Union army was entrenched on the hill overlooking the Neuse while the Confederate army held the right bank of the river in what is known as the Piney Grove community. Most of the town was destroyed by the bombardment of the Union cannon. The booming trading center that Whitehall had been, before the Union army burned it to the ground, was never rebuilt.

After the Civil War, the resort possibilities of the community were developed and two hotels, the Seven Springs Hotel and the Ninth Springs Hotel, were built in the area by the Whitfield families. Both the resorts were popular with people from eastern North Carolina. North Carolina Governors including Jarvis, Kitchin and Aycock visited the springs. The resort hotels operated excursion boats which carried tourists up the river to see the cliffs.

Whitehall again became a thriving community with several boat docks, a cotton gin, a supply store, a blacksmith, a boarding house, a doctor's office and several other businesses. In the early 1920's, the town was again partially destroyed by fire. Since then, only a few of the businesses have been rebuilt and, of course, river traffic no longer comes as far north on the Neuse as Seven Springs.

Up until the early 1900's there were two federally operated liquor stills in the vicinity of Cliffs of the Neuse State Park. In addition, there were a cotton gin and a grist mill located at the fork where Still and Mill Creeks come together. A ferry and two roads made all of these places easily accessible, the ferry transporting fertilizer shipments across the river. There was a warehouse or "store" in the general area of the still where the liquor was stored and also sold on occasion. A miller's house was also located nearby. The mill was a corn mill intended mainly for local use and had only one grinding stone turned by a mule.

On March 7, 1944, Thomas W. Morse, Superintendent of North Carolina State Parks, received a telephone call from Lionel Weil, inquiring about the possibility of establishing a state park on a tract of land of 110 acres known as the Cliffs of the Neuse. "The tract," he said, was "approximately 12 miles from Goldsboro and not far from Seven Springs." Although the proposed 110-acre site was too small for a state park, Weil was not discouraged, and with the assistance of others, continued to pursue the establishment of a park.

By deeds dated May 10, 1945, 291 acres of land were

transferred by Lionel Weil through the Wayne Foundation, and 30 acres from the Davis family of Mount Olive, to the State of North Carolina to be used as a state park. Approximately nine years later, on February 10, 1945, a second gift was made by the Wayne Foundation of 33.78 acres, and in August, 1957, a 10-acre tract was added through the generosity of Miss Elizabeth Rosenthall of Goldsboro. A major step toward the development of this park was taken in 1945 by the Board of Conservation and Development. At its meeting in Morehead City on July 20, 1945, the Board voted to approve an Advisory Committee for the Cliffs of the Neuse State Park.

The first ranger-in-charge was assigned to the park in 1946 and, in the following year, the General Assembly appropriated money for the first capital improvements. During the next ten years numerous improvements were made to the park. Between 1948 and 1950, the main park roads were constructed and paved, the picnic shelter constructed, and a camping area installed. In 1952 the lake dam was finished and by 1955 the swimming area and beach were completed. The formal overlook of the cliffs was built two years later.

Adjacent Land Use

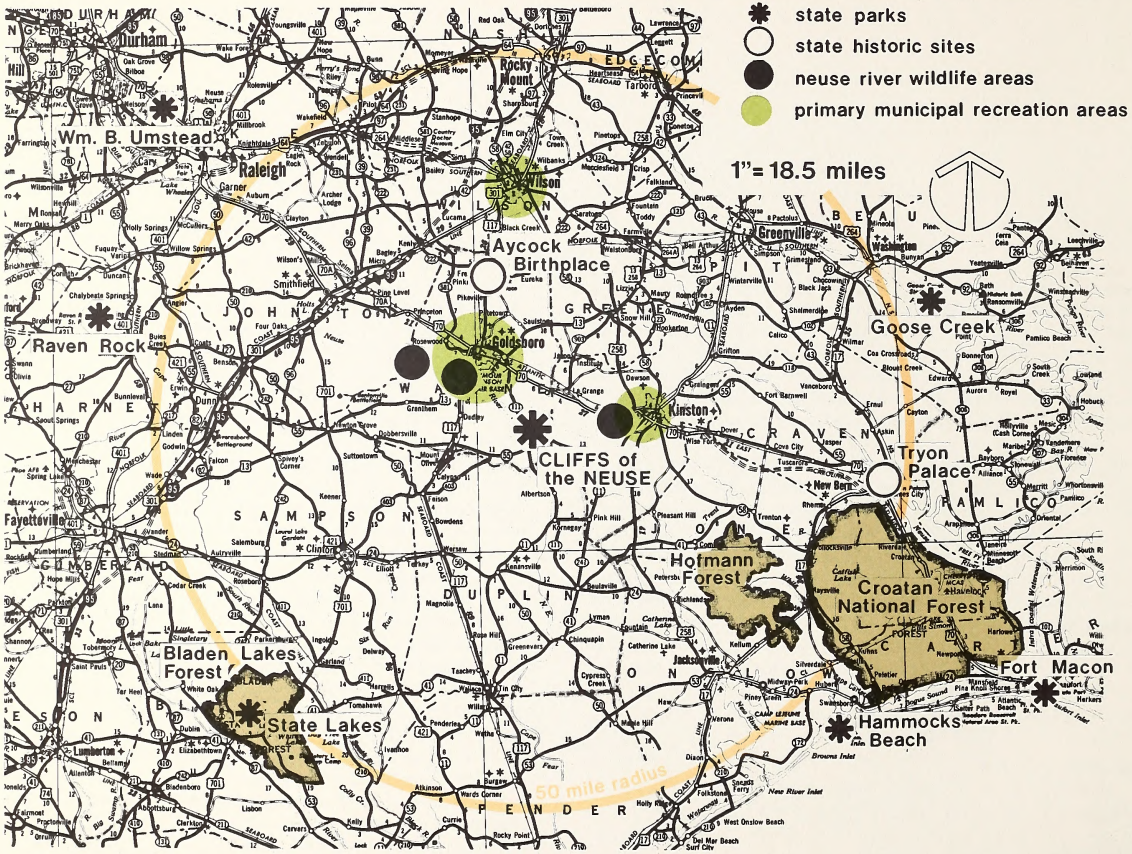
Wayne County is largely agricultural in nature, and this characteristic holds true around Cliffs of the Neuse State Park. The park is nearly surrounded on three sides by agricultural fields. The fourth side is not farmland due to the very low flood plain on that side of the Neuse River.

The short, mild winters and long, hot summers permit a wide range of farming and choice of crops in the county. Tobacco, corn and soybeans are the chief crops, although small grains, cotton and vegetables are also grown. The remaining major production is directed toward forest products and management. Approximately 165,300 acres of the county are used for agriculture, about 7,100 acres for pasture, and 157,800 acres for woodland.

Cliffs of the Neuse State Park is located on one of a series of high cliffs along the Neuse River. These cliffs tend to run northwest to southeast along the river, and have formed good farmland both on the ridgetop and some of the higher bottomlands. This type of farmland is present on the north, west and south sides of the park, with woodlands actually between the agricultural land and the park boundaries. East of the park, across the Neuse River, the land is very low and frequently floods. This land has wisely been left as woodland because it floods too frequently to be useful as agricultural land. However, the higher ground further east and alongside the river is intensively farmed above the floodline.

The town of Seven Springs and its small commercial district sit by the river approximately 3.5 miles east of the park. The only other substantial land uses close to the park are residential in nature, and most of these are along the roadsides, with the lands away from the roads used for farmland or woodland. There are no large commercial or industrial areas along N.C. 111 as it passes close to the park.

REGIONAL PUBLIC RECREATION SUPPLY



Recreational Supply and Demand

Within the region, there are relatively few recreational facilities provided by private enterprise. The great majority of these consist of golf courses, a number of which are by membership only, fishing access areas, and stables. One of the largest of these facilities is the 368-acre golf course provided for military personnel at the Seymour Johnson Air Force Base in Goldsboro. This facility receives an annual use of 40,000 people per year. The Walnut Creek Country Club operates a golf course open to private membership and is situated in a 2,000-acre site between Goldsboro and Kinston. Another private golf club is the Sleepy Creek Club which occupies about 400 acres west of Cliffs of the Neuse south of Goldsboro.

Most fishing areas managed by private enterprise are situated on old mill ponds and are open to the public for a nominal fee. Several of the sites are located south of Kinston in Lenoir County including the Ellis Davis Mill Pond, Noble Mill Pond, and Toll's Mill Pond. This latter facility is the largest, containing about 250 acres of water surface.

A number of riding clubs are located in the region offering rodeo or general trail riding to the public. In Wayne County, the main horseback riding facilities are Cox's Mill Riding Stable and Bright Leaf Saddle Club, both located west of Goldsboro.

The primary recreation facilities provided by local government are located in Goldsboro and Kinston. Several parks providing day use facilities to residents are located in these cities. In Goldsboro, Berkley Memorial Park, Mina Neil Park, Fairview Park, and Herman Park account for 87 acres of public open space. In addition to picnicking facilities, more intensive activities are provided including tennis courts, softball fields, and recreation centers.

Several areas for public recreation are owned and managed by state agencies. On the Neuse River, the N.C. Division of Wildlife Resources operates three river access areas in the area of Cliffs of the Neuse. The first is about 30 miles upstream from the park at the S.R. 1006 bridge. The second access area is located south of Goldsboro at the U.S. 117 bridge, 17 miles upstream from the park. At Kinston, some 20 miles downstream from the state park, the third access area is located near the U.S. 70 bridge. The Wildlife Access Areas provide parking areas and boat launches which are utilized mainly by fishermen.

Hunting is a popular activity in the region and a number of areas are owned and managed by private enterprise for this purpose. One state game land, managed by the N.C. Division of Forest Resources and containing 690 acres, is located in the region. It is the H.M. Bizzell, Sr. Game Land, several miles north of Kinston on N.C. 58. Public hunting is also permitted at the 26,000-acre Hoffmann Forest in Jones County.

There are no other state parks located within a 50-mile radius of Cliffs of the Neuse. Immediately beyond the edge of this radius, however, are nine state parks which overlap the market area of Cliffs of the Neuse. The following is a listing of these parks showing existing and proposed land acreages:

State Park	existing	proposed	total
Carolina Beach	1740	70	1810
Goose Creek	1209	474	1683
Hammocks Beach	892	1108	2000
Fort Macon	385	0	385
Lake Waccamaw	273	1385	1658
Medoc Mountain	2305	192	2497
Raven Rock	2727	2791	5518
State Lakes	3325	1795	5120
Wm. B. Umstead	5224	681	5905

Of these nine parks, four may be considered extensively developed in comparison to the park system as a whole. Carolina Beach, Fort Macon, and William B. Umstead State Parks provide extensive day use facilities and, with the exception of Fort Macon, overnight camping. Within the State Lakes area, Jones Lake State Park and Singletary Lake State Group Camp provide both day and overnight facilities. While all of the parks except Carolina Beach and Hammocks Beach have had master plans prepared within the past three years, the majority of the parks contain only "interim" facilities.

With respect to total land area, the current standard for North Carolina State Parks, as set forth by the Statewide Comprehensive Outdoor Recreation Plan, is 15 acres per thousand population. Other sources, however, indicate that this standard may be too low and that a figure of 40 acres per thousand population is more appropriate as leisure time and interest in different forms of recreation increases. An analysis of projected land acquisition needs was carried out for Cliffs of the Neuse State Park. This analysis was conducted for the purpose of determining whether the 571 acres presently making up the park are satisfactory according to park standards or whether there is a need, based on population trends, for further land acquisition. Additional land needs may be interpreted as demand for park expansion or as justification for new state park areas. The analysis looks specifically at the acreage and population variables with respect to Cliffs of the Neuse State Park and the nine other state parks previously mentioned. The extent to which the market area of the other parks overlapped with Cliffs of the Neuse moderated land acquisition requirements. This analysis indicated that a shortfall of over 12,000 acres exists for a standard of 20 acres of parkland per thousand population within 50 miles of the park. Within this radius, the current state park land averages 7.99 acres per thousand, suggesting a need not only for additional land at Cliffs of the Neuse State Park but generally throughout the region. For Wayne County this analysis results in a deficit of nearly 1,800 acres.

From the inventory of public and private recreation facilities in the region, it is clear that Cliffs of the Neuse State Park is an invaluable resource. No other facility in the region offers a similar "cluster" of activities — ranging from nature interpretation to swimming. Additionally, no other facility provides a natural area of nearly the extent or quality provided at the park.

While specific demand for recreational facilities is difficult to document, a relative shortfall of various types of overnight facilities is clear. Cliffs of the Neuse is the only park in the region which provides public campsites. Furthermore, there are no family or group cabin facilities and no areas managed specifically for primitive camping.

The preliminary General Plan for the North Carolina State Trails System indicates that a primary trail route will, in the future, connect Raleigh and Morehead City. Cliffs of the Neuse State Park is proposed as a point through which the trail will pass on its way to the coast.

Existing Conditions

In comparison to other state park areas, in general, Cliffs of the Neuse State Park is highly developed for recreation facilities. Not only is the park small by statewide standards but all of the

developed facilities are clustered within about one-fourth of the total area. From the point of view of the protection of natural resources as a whole, this may be a good policy. The developed area, however, is suffering from many problems of overuse, resource deterioration, despoliation, and overcrowding.

Intensity of use of any park facility is directly related to accessibility. An analysis of relative traffic volumes at the park indicates that the majority of vehicular traffic moves from the park entrance to the main parking lot which serves the picnicking and swimming area. The second greatest volume of traffic consists of service vehicles circulating around the park office and maintenance area. A considerably smaller amount of traffic utilizes the main park road to the Interpretive Center/Cliffs area and the loop road at the tent and trailer camping area.

Predictably, the park facilities receiving the greatest use are the picnicking and swimming areas. An analysis of 1976 data indicates the following ranking of facilities according to annual intensity of visitor use:

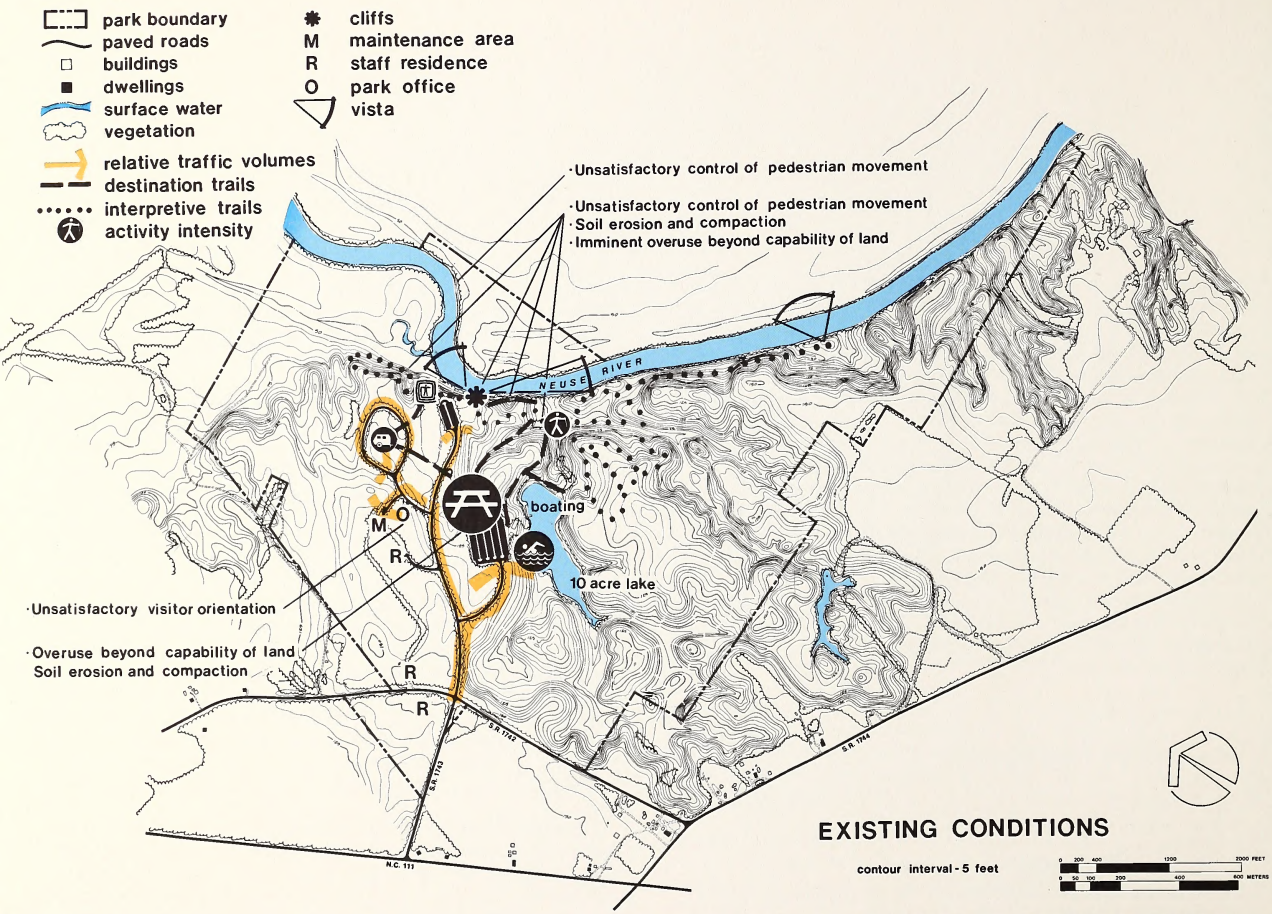
Activity	% Use
1. Picnicking	37.42
2. Swimming	22.75
3. Tent and Trailer Camping	18.06
4. Hiking	13.35
5. Boating	3.38
6. Interpretive Center	1.87
7. Fishing	1.59
8. Primitive Camping	1.54

From this ordinal measurement, two important inferences may be made. First, the resource degradation which is apparent at the picnic area is a direct function of having too many people in one place over an extended period of time. In other words, density of use is excessive. Had the facility been managed under a more controlled basis for lower levels of use, the deterioration of the site would not have occurred nearly as rapidly. Second, the deterioration of the Cliffs area is not a function of overuse as much as it is a characteristic of the resource's fragile nature. This means that in order to protect the quality of the cliffs any visitor use of the area must be highly controlled. Additionally, any increase in use at this area will have significant impact unless specific moderating measures are taken.

Despite the high level of use emanating from the main parking area, the swimming area is an attractive and well-maintained facility. While there are 1,080 baskets available in the bathhouse presently, "optimum" use of the area is in the range of 600-900 people at one time. This is an estimation based on the maximum number of people which can be safely and effectively managed.

The tent and trailer camping area is also in very good condition. Although the 35 sites are simultaneously filled less than ten times during the year, use of the area has been increasing. Several times during 1977 there was an overflow crowd. The one-way loop road and washhouse are in excellent condition and there is surprisingly little evidence of natural resource degradation.

Pedestrian movement in the park can be broken down into destination-oriented and interpretation-oriented traffic. The latter category fits for all use of designated interpretive trails. These trails are also the only ones which have been deliberately created and maintained by park staff. Included in this category are



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Spanish Moss Trail extending north of the interpretive center and Bird and Galax Trails which run south and east of the center. The trails are eroded and in need of immediate repair, particularly where they traverse steep terrain.

Destination trails are those which interconnect various park facilities such as the tent and trailer camping area and swimming area. Unlike the interpretive trails these trails were neither cut nor designated by park staff. These trails were created over time by park users and have never become designated trails. Nevertheless they are the most heavily used footpaths in the park. In particular, the trail leading from the picnic area to the river is very heavily used. Likewise, the trail which runs toward the river from the swimming area carries a great deal of traffic. Due to its ridge location, however, this latter trail shows greater signs of deterioration in the form of soil compaction and erosion, especially where it descends the ridge to the river flood plain.

The park office, maintenance area, and staff residences are all in good condition. Administratively, the park office and maintenance area complex is very suitable. In this respect, the tent and trailer camping area is well-controlled and the distribution of camping permits is convenient. In terms of visitor information services, however, the park office does not work well. The present location of the office is too distant from main activity areas to provide optimum information services. Additionally, visitors are not directed to the office for information, and even if they were, they would not be guaranteed of finding any staff in the office after noon. In an effort to promote a more balanced use of park facilities and to provide more direct information to visitors, information services should be made more accessible to the public.

According to the park staff, fishing from the bank of the Neuse River is a popular activity in the park, and is fairly productive. Unfortunately, the fishermen have increased the problems of trail maintenance and erosion of the river banks. Nevertheless, the river is the only available fishing resource because the park's ten-acre lake is not productive for fishing. The water in the lake is excessively acid; therefore, it is not suited for fish reproduction. Additionally, management procedures necessary to rectify this problem are costly and must be applied on a continual basis.

The undeveloped portion of the park — the rough terrain south and east of the lake, and the flood plain area north of the museum and on the opposite side of the river — has been undergoing management as a park natural area. This area has recently been proposed as a designated park natural area within which only minimal recreational development and use may occur. At the present time only fishermen and hikers utilize the area.


NATURAL RESOURCES

Geology

Wayne County is covered by surficial sand of post-Miocene age. This material is about 80 feet thick in the vicinity of Seven Springs and less than 40 feet thick elsewhere in the county.

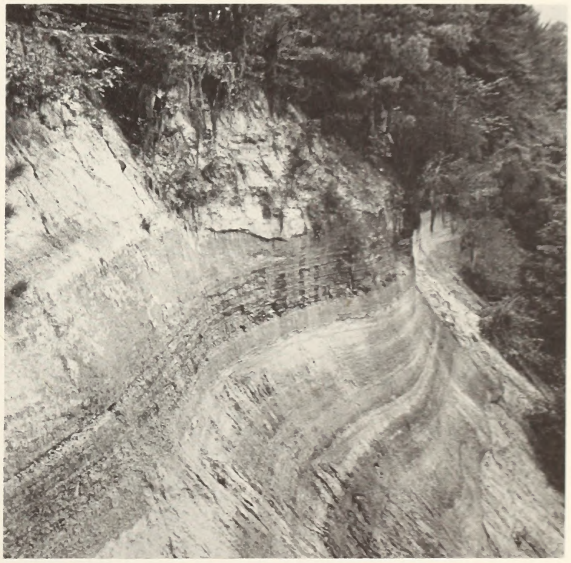
The Yorktown formation of late Miocene age underlies these surficial sands, and is composed of gray marine clays interbedded with thin shell beds. In northern Wayne County the formation attains a maximum thickness of about 60 feet. Depending on its location within the county the formation lies unconformably on Cretaceous formations or basement rock.

The Castle Hayne limestone of Eocene age appears as scattered outliers in the southern part of Wayne County, and it varies in thickness across the county. Underlying the Castle Hayne limestone and younger formations is the Black Creek formation of late Cretaceous age. This formation crops out in the southern part of the county, particularly at Cliffs of the Neuse, and appears in the subsurface throughout most of the county. The Black Creek formation thickens toward the southeast attaining a thickness of about 250 feet at Seven Springs. Underlying the Black Creek formation is the Tuscaloosa formation. This formation is the basal sedimentary layer in Wayne County and is almost 200 feet thick at Seven Springs. The basement rock in Wayne County is chiefly slate. The surface of the basement rock is uneven and slopes to the southeast.

Geologic studies show that the sediments visible in the Cliffs of the Neuse belong to the Black Creek formation, and were deposited some 90 million years ago. The Cliffs were formed by the Neuse River, which gradually cut into the Black Creek formation by erosion.

The Cliffs are composed predominantly of layers of multicolored sands, sandy clays, small gravels, shale and sea shells. The sands are fine-grained and appear in beds from three inches to about two feet thick. Cross bedding is prominent, and colors vary widely with white, tan, yellow and brown being the most common.

Layers of dark gray to black shale are also present and are somewhat better exposed a few hundred feet up river from the main bluff. These shales often carry considerable amounts of sulphur and in places a bright brassy iron sulfide is found. Within about four feet of the top of the Cliffs there is a narrow zone of highly calcareous material containing ancient sea shells. A more pronounced zone is present about 15 feet above the normal river level and contains larger shells.



Ground Water

Except for the municipal supply in Goldsboro, all municipal and domestic water supplies in Wayne County are obtained from wells. Surficial sand supplies water to domestic wells in the area south of the Neuse River, and the yield from this material does not exceed ten gallons per minute. The water is soft but commonly is corrosive to metals and contains objectionable amounts of iron.

The Yorktown formation is currently tapped by shallow wells in the northern part of the county, and provides water which is moderately hard but still suitable for domestic purposes. The yield of these wells rarely exceeds 25 gallons per minute. The Castle Hayne Limestone furnishes water to a few wells 40 to 50 feet deep in one area of the county, but they yield less than ten gallons per minute.

The Black Creek formation is used as a water source in the southern and southeastern portions of Wayne County, and usually requires wells less than 150 feet deep. Domestic wells developed in this formation yield less than 25 gallons per minute, and the water is generally corrosive with an objectionable iron content.

In the central part of the county, the Tuscaloosa formation is tapped principally by municipal wells. In the northwestern part of the county the formation is thin and furnishes little water, while in the southeastern part of the county the depth of the formation has prevented its use as an aquifer. The water from this formation may be moderately hard but it is otherwise suitable for most domestic purposes.

The basement rocks, chiefly slate, are tapped infrequently as a water source. The yield of wells in basement rock is small and the water generally has a high iron content.

Surface Water

Surface water includes all streams, creeks, and rivers, as well as all ponds and lakes, both man-made and natural. The most visible and dominant single surface water feature at Cliffs of the Neuse State Park is the Neuse River.

As the river flows through the park boundaries, it is about 200 feet wide and approximately 15 feet deep. On an average flow day it is carrying about 2,500 cubic feet of water per second past the cliffs. The overall drainage basin for the Neuse River covers 6,192 square miles over a basin length of about 180 miles and width just under 50 miles. The actual river length from its formation at the confluence of the Eno and Flat rivers northeast of Durham to the Pamlico Sound is approximately 300 miles. The major tributaries to the Neuse River along this length are the Flat River, Eno River, Little River, Trent River and Contentnea Creek.

The Neuse River watershed lies within two of the State's three physiographic regions. The upper third of the watershed lies within the Piedmont, while the lower two-thirds lie within the Coastal Plain.

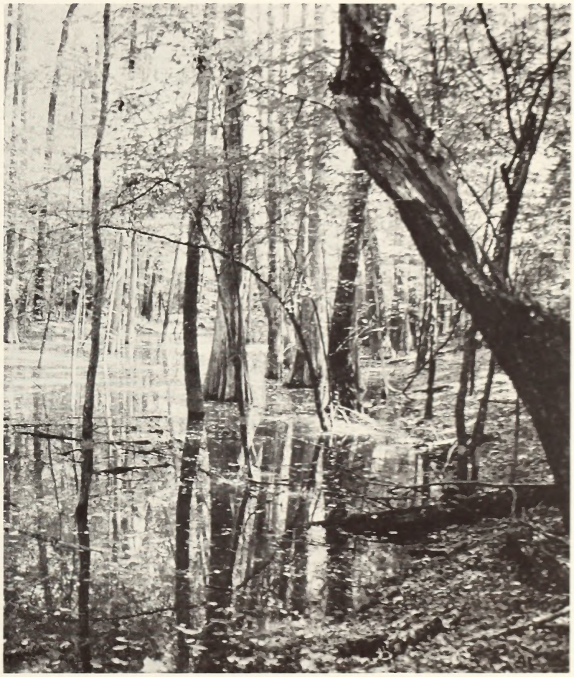
There are very distinct differences in river characteristics within the two physiographic regions. The Piedmont streams flow through an undulating terrain with relatively deep valleys and narrow flood plains which hold the waters within well defined banks. These streams generally are swift and contain sequences

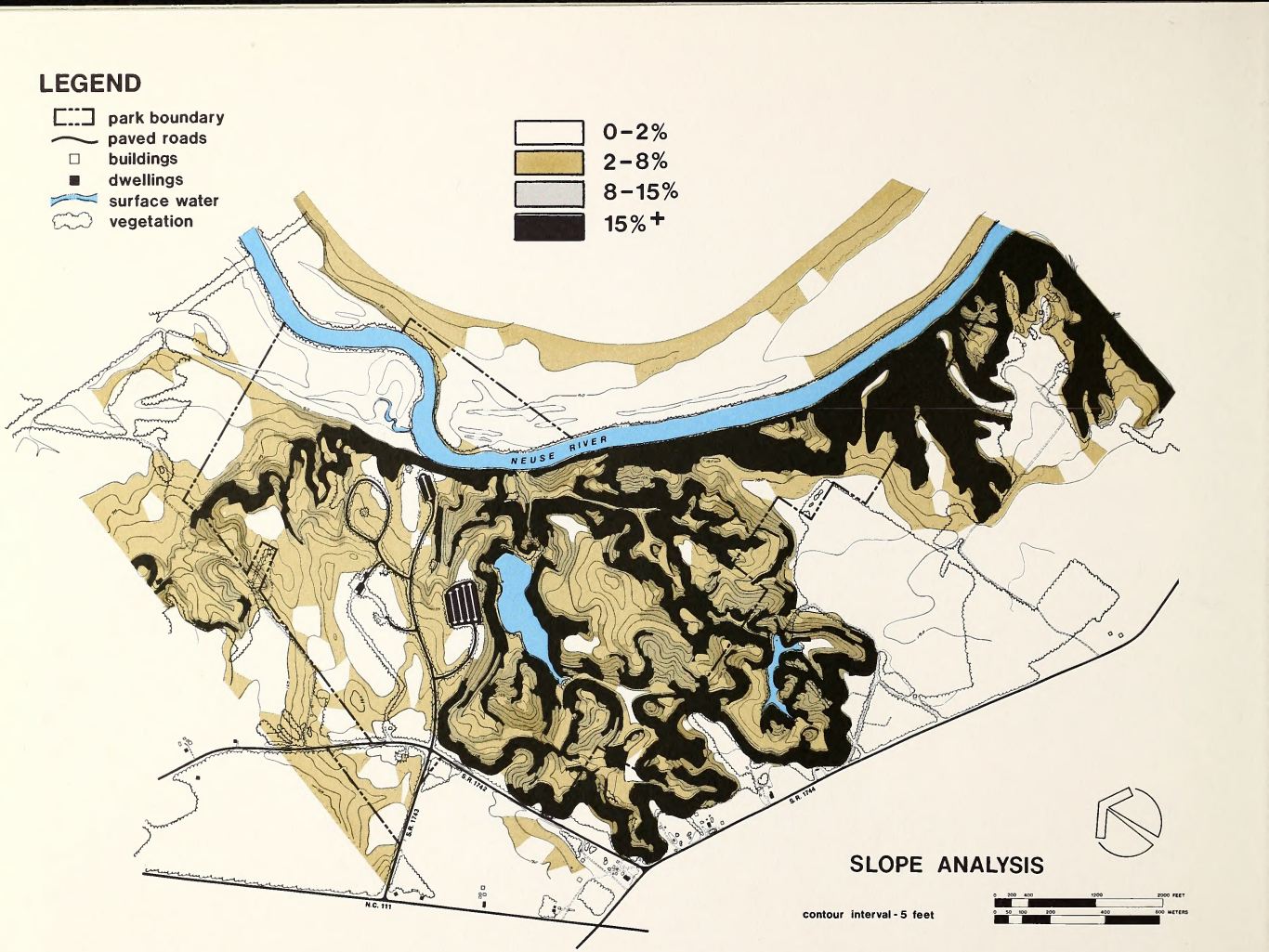
of pools, rapids and rocky shoals. The Eno, Flat, and Little Rivers, which drain into the Neuse River, have average stream gradients of 14, 16, and 19 feet per mile, respectively. The portion of the main-stem Neuse River within the Piedmont has an average gradient of two feet per mile.

The streams of the Coastal Plain, however, flow through a flat terrain with wide flood plains. The average stream gradient within this region is only 0.6 foot per mile. The Coastal Plain streams are characterized by slow-moving water, low banks and frequent flooding following heavy rainfall within the drainage area, resulting in quickly fluctuating water levels.

There are two flowing creeks on the park property which are fed by numerous springs. One stream is known as Mill Creek because there was once a grist mill located along its length. The other stream is known as Still Creek, and its name comes from the fact that there was once a licensed still on it. Both of these streams converge into one watercourse which then continues approximately 100 feet to the Neuse River. The water in both these creeks is extremely acid, and apparently neither supports a fish population.

The dam creating the recreation lake within the park was constructed on Mill Creek and created approximately ten acres of water surface area. This lake was constructed in the early 1950's, and has been heavily used for both swimming and boating since. The lake has been chemically treated yearly to inhibit growth of plants on the bottom. This must be done to keep the desired sandy bottom on the swimming area and to prevent this bottom vegetation from spreading over the entire lake. The water quality, however, is still maintained at a very good level for swimming and wading.





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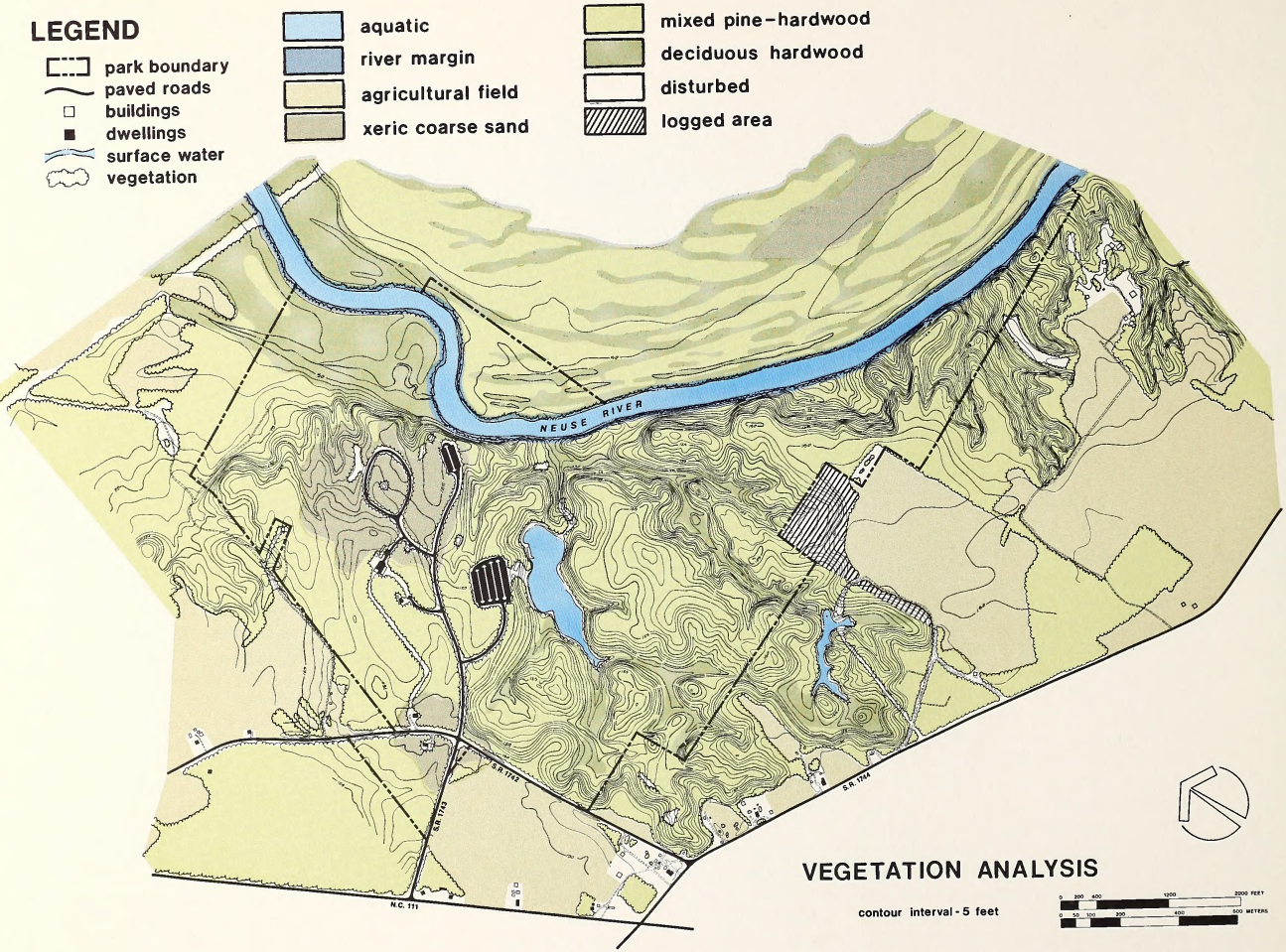
Elevation and Slope

Relative elevation in the park varies from slightly more than 150 feet to less than 50 feet above sea level. All park facilities, with the exception of lake activities and hiking trails, are situated above the 100-foot elevation. The 100-year flood plain elevation is about 50 feet above mean sea level.

The area within the park can be broken into three topographic classes: flat, low-lying ground and flood plain, gently sloping upland, and rough upland ravines. The first category, flood plain, occupies about 70 acres in the park. All of this area is associated with the Neuse River and has a consistent gradient of less than two percent.

The gently sloping upland area occupies about 150 acres in the park. It is predominately located east of the lake on a long ridge which extends northeasterly through the park to the river. Within this area, slopes range from zero to eight percent. As one would expect, it is on this terrain that all park facilities and access roads are located. As a result, about three-quarters of this area is actively used at present. One other large area which fits this category is situated along the top of the ridge immediately east of the lake. This area covers about 20 acres and ranges between two and eight percent slope. Within the present park area, this is the only sizable land area which, with respect to slope, may accommodate any extensive expansion or relocation of facilities. Several other areas which fall into the category of gently sloping upland do exist within the park boundary. These areas, however, are small and not contiguous to the larger land areas and, therefore, have less value for major facility expansion.

The third topographic class, rough upland ravines, covers a majority of the park's land area and is predominately located south and east of the lake. This area forms a bowl based on the Still and Mill Creek's watershed. Terrain in the area is extremely steep; the slopes are over eight percent with more than one-half exceeding 15 percent. Along the south shore of the river, downstream of the confluence of Still and Mill Creeks with the Neuse, the bluffs are extremely steep. Having a mountainous appearance, this type of landscape is unique to the region.



CLIFFS OF THE NEUSE STATE PARK

wayne county

north carolina

Vegetation

Cliffs of the Neuse State Park contains a wide range of vegetational communities within its boundaries, ranging from dry upland pinelands to wet bottomland hardwoods. Some relatively unexpected floral species are found in the park, such as the large amount of Spanish moss which is present in nearly all the forested areas close to the Neuse River. Also, a typical mountain plant, galax, is present on well drained, mesic, generally north-facing slopes throughout the park. Two more typically western species, red oak and Virginia pine, combine with the Spanish moss and galax to illustrate the diversity of the plant communities in this park.

The plant communities can be combined into six distinct vegetation types: mixed pine-hardwoods, deciduous hardwoods, river margin, xeric coarse sand, disturbed and aquatic. On the vegetation map another community, agricultural field, was added to complete the vegetation coverage. The park Natural Area encompasses examples of each of these communities, particularly the best locations for galax and Spanish moss.

Mixed Pine-Hardwoods Community

The mixed pine-hardwood community is the most widespread community type found in the park. This community is found both on the upland xeric habitats, and in some of the mesic ravines, where the soil is moist, but not permanently wet.

The more xeric species of this community type are observed on nearly level land surfaces which are well drained, and have soils ranging from sandy loams to more moderately compact loams. Loblolly pine, post oak, scrubby post oak, southern red oak, and to a lesser degree, blackjack oak, are the major canopy species found on these upland sites. Trees found intermingled with the above, but to a lesser degree, are dogwood, American holly, wax myrtle, mockernut and sandy hickory, and sassafras. These plants, however, are more typically noted in the understory. The herbs that appear most often in this area are yellow jessamine, honeysuckle and bracken fern.

In the more mesic habitats of this mixed pine-hardwood community, the species composition changes but the general aspect remains much the same. The topography is slightly more rolling, and the soil becomes more loamy. The xeric oaks are replaced by white oak, water oak, and black oak. Other dominant trees observed in the canopy layer are sweet gum, red maple,

beech, and loblolly pine. One of the key indications that these areas are wetter is the presence of cane in the herbaceous layer. Approaching the higher uplands and surrounding ridges, this species diminishes and is absent in the drier sites.

Deciduous Hardwoods Community

The deciduous hardwoods community is best exemplified in the lower areas surrounding Mill Creek and Still Creek, a larger area in the vicinity of the Spanish Moss Trail just north of the interpretive center, and in the stand of bottomland woods directly in front of the "cliffs" on the east side of the Neuse River. These hardwoods are present along most of the streambeds in the park, but the size of the stands does not approach that of the areas mentioned above.

The main species composing the canopy of this community type are sweet gum, black gum, red maple, pignut hickory, red ash, black walnut, beech, and several species of oak including white oak, water oak, overcup oak, willow oak, swamp chestnut oak, black oak, and southern red oak. Loblolly pine, a dominant tree on the upland habitats in the park, is present in these bottomlands only to a limited degree. Species occurring in the understory layer are sourwood, red mulberry, hophornbeam, ironwood, styrax, sweet bay, dwarf pawpaw, witch hazel, and dogwood. In the herbaceous layer, galax, partridge-berry and heart-leaf are very common. Many ferns, including Christmas, cinnamon, royal, and resurrection ferns, are also common in this low bottomland habitat.

River Margin Community

The river margin community is restricted to narrow tracts of land bordering the banks of the Neuse River. This vegetation type is easily recognized by the presence of river birch, sycamore, black willow, bald cypress, black gum, red ash, and ironwood.

In the northeastern portion of the park, the habitat conditions are different. Water as much as two feet in depth is often seen standing above the ground surface. This area in the park is also located along the Neuse River, but the community extends further inland than at any other point in the park, and is due primarily to the low landscape in this area. In this community cypress and black gum trees occupy soils which are not subject to drying out in the late summer. Ironwood, red maple, and sweet gum also make up the canopy layer. River birch is not as plentiful in this inland area as it is on the river banks, and black willow is completely absent. Practically no herbaceous plants are present, due probably to the long periods of standing water.

Xeric Coarse Sand Community

The xeric coarse sand community is observed on the upper and more level land surfaces in the park, and the vegetation is typical of that found in the sandhills of North Carolina. The canopy layer of this community type is relatively low and the area is fairly open. The primary trees present are loblolly and longleaf pine, and turkey oak. However, scattered throughout this area are other species, such as post oak, scrubby post oak, blackjack oak, and bluejack oak. A few of the many shrub and herbaceous plants are dangleberry, dwarf huckleberry, St. Andrew's cross, wire grass, and bunch grass.

Northwest of the interpretive center parking lot is another sandy habitat, but the canopy is composed almost entirely of loblolly pine. This area, which was at one time a cultivated field, was planted with these pines after the park was established in 1944. However, many of the herbaceous plants found under this stand of level pines are similar to those in the natural coarse sand community type.

The "sandhills" community in the park is best characterized by the clumping of plants into small patches separated by the bare white sands and the dryness caused by rapid drainage. The relatively low water content of the plants in this community subjects all of the area to continuing fire danger.

Disturbed Community

The disturbed plant communities are found primarily along roadsides, ditch banks, edges of parking areas, and open areas throughout the wooded section of the park. Many plants representing quite a diverse group of families are observed in these sites. A few of the more common flowering plants include black-eyed Susan, bitterweed, plantain, ragweed, hercules club, indigo, butterfly weed, and wool mullein. Also included in this designation and shown on the vegetation map are residence yards, mown areas, areas disturbed by prior construction activities, and vegetation communities which have been logged.

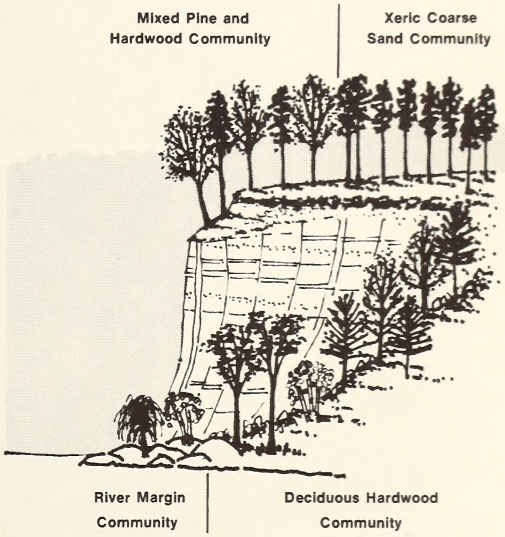
Aquatic Community

The aquatic community contains very few species of vascular plants. With both the Neuse River and a lake in the park, this community could be expected to contain a well developed flora. However, to facilitate boating and swimming, the lake is treated with chemicals to inhibit growth of vegetation within its shoreline. Additionally, the water current in the Neuse River is swift enough to limit the opportunities for vascular plants to become established. These two factors can be responsible for the lack of a large number of species in this community type.

The lake water does support the water milfoil in fair abundance. Otherwise, the common rush, water smartweed, arrow-leaved tear-thumb, inland sea oats and spotted touch-me-not are the main plants observed on the edges of these habitats.

Agricultural Field Community

The agricultural field community was added to the vegetation map to complete the total vegetation analysis around the park. Included in this community are those fields which are under regular cultivation or are grassed and used for pastureland.

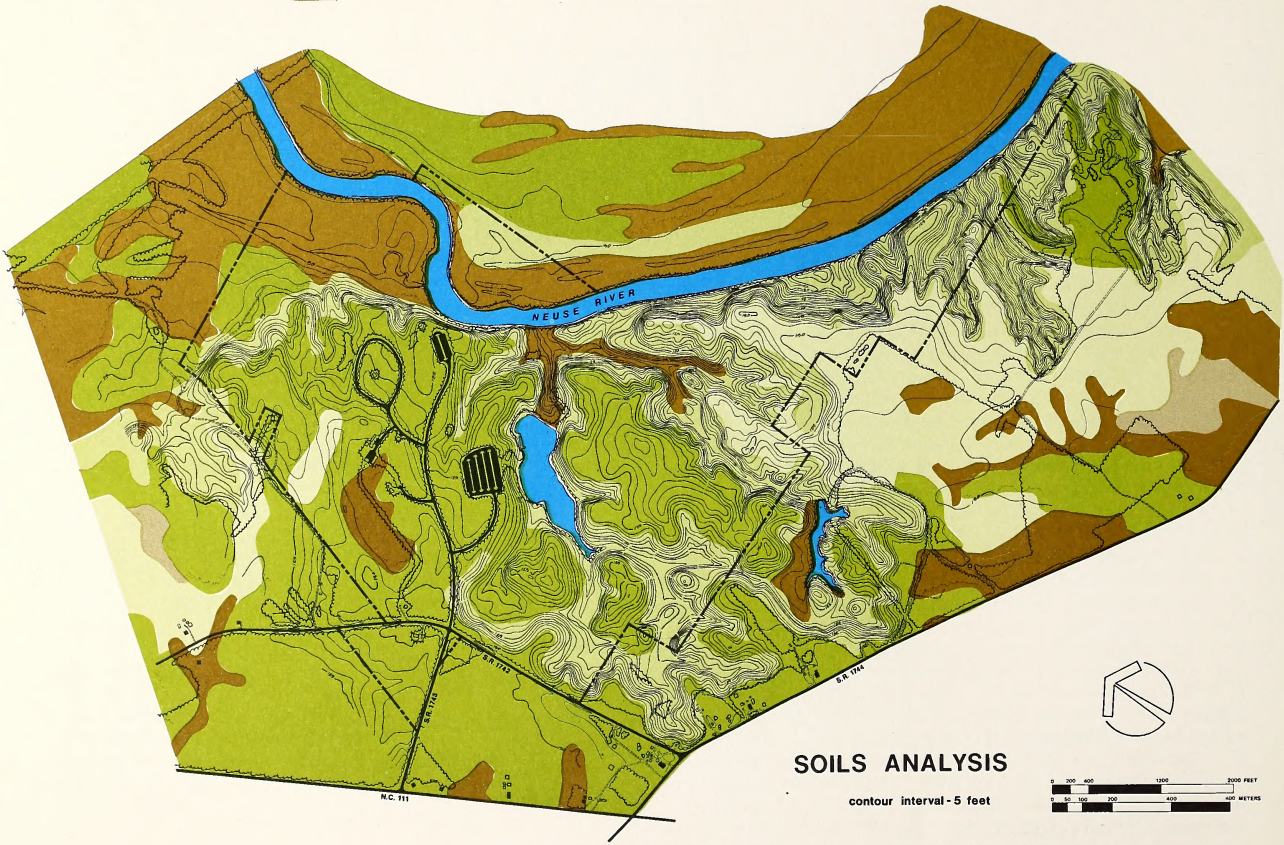


VEGETATION CROSS-SECTION

LEGEND

- park boundary
- paved roads
- buildings
- dwellings
- surface water
- vegetation

- no significant limitations
- slight to moderate
- slight to moderate: sandy
- slight to moderate: wetness
- moderate to severe: sandy or wetness



SOILS ANALYSIS

contour interval - 5 feet

0 200 400 1200 2000 FEET

0 50 100 200 400 600 METERS

CLIFFS OF THE NEUSE STATE PARK

wayne county

north carolina

Soils

The soils in the vicinity of Cliffs of the Neuse State Park fall into four major associations, or landscapes that have a distinctive proportional pattern of soils. Seven soil associations have been identified in Wayne County, but only four have been defined in and around the park.

The first of these associations is the Wagram-Kenansville association, which consists of approximately 40 percent Wagram soils, 30 percent Kenansville soils, and 30 percent minor soils. This association is typically found on well drained, nearly level to strongly sloping uplands and terraces, and consists of broad smooth divides that are rounded near drainageways. The minor soils in this association which are in the vicinity of the park include Lynchburg, Rains, Torhunta, Bibb, Troup and Norfolk.

The next classification is the Wickham-Johns association, which is about 32 percent Wickham soils and 20 percent Johns soils. The remaining 48 percent is minor soils: Kenansville, Kalmia, Leaf, Torhunta, and Bibb, in the area around the park. This association consists of fairly broad, long, low ridges and depressions on stream terraces, particularly the terrace along the Neuse and Little Rivers.

The Johnston-Chewacla-Kinston association consists of soils on flood plains along the major streams. It is about 40 percent Johnston soils, 10 percent Chewacla soils, and 10 percent Kinston soils. The remaining 40 percent is minor soils, mainly Bibb and Leaf soils close to the park. These soils are very poorly drained to somewhat poorly drained, nearly level along the streams, and are subject to frequent flooding.

The Lumbee-Torhunta association is not evident close to the park due to the relative scarcity of its parent soils in that area. The association contains poorly drained, nearly level soils on uplands and broad, smooth, flat areas on stream terraces. It is about 27 percent Lumbee soils and 23 percent Torhunta soils, with the remainder being Leaf and Johns soils in the park area.

In all, there are 19 soils in the area closely surrounding the park. Analysis of soils matrix "B" reveals that these soils exhibit from slight to severe limitations for the listed park uses depending on a variety of characteristics. The soils which are only slightly limiting for the rated uses are not shaded, while the moderate limitations are lightly shaded and the severe limitations are shown by the darkest shading.

Slight limitations mean that the soils have few or no properties unfavorable for a particular use or that the properties can be easily corrected. Moderate limitations mean that the soils have one or more properties unfavorable for the rated use or that the problem can be corrected with correct planning. Severe limitations mean the soils have one or more properties very unfavorable or the problems cannot be overcome without major expense or reclamation work.

The soils which exhibit similar characteristics can be combined into groups for comparison. These combinations are shown in soils matrix "A", which breaks the soil limitations into three groups and the soil conditions causing these limitations into three groups. The soils cause problems for development in two ways for the purpose of this chart; specifically, excessive wetness of the soil and a relatively high amount of sandy material in the soil profile. Otherwise, the third category is rated as having no significant soil-related conditions. This matrix makes the relative desirability of the various soils for development apparent. There are two soils, Norfolk loamy sand and Wickham loamy sand,

which have very slight limitations, while Kalmia only exhibits characteristics rated as slight to moderate (depending on slope).

The soils which have sandy materials in the profile and range from slight to moderate limitations are Kenansville loamy sand, Lakeland sand, Troup sand, and Wagram loamy sand. The degree of limitation for these soils is based on slope and trafficability (or the ease with which people can move across the soil). Rimini sand has moderate to severe limitations basically due to poor trafficability and susceptibility to soil blowing.

Only one soil type, Goldsboro loamy sand, has slight to moderate limitations because the seasonal high water table is only 30 inches below the surface. The remaining soils have moderate to severe limitations because the seasonal high water table ranges from the surface to only 18 inches below the surface. These soils include Leon sand, Bibb, Johns, Lynchburg and Rains sandy loams, and Chewacla, Coxville, Kinston, Leaf and Torhunta loams.

SOILS MATRIX "A"

Soil Conditions	Degree of Limitations	None to Slight	Slight to Moderate	Moderate to Severe
	No Significant soil related limitations	Norfolk Wickham	Kalmia	
	Sandy material		Kenansville Lakeland Troup Wagram	Rimini
	Excessive wetness		Goldsboro	Bibb Leaf Chewacla Leon Coxville Lynchburg Johns Rains Kinston Torhunta

SOILS MATRIX "B"

	Road Fill	Dwellings	Septic Field	Campsite	Picnic	Playfield	Highway
Bibb Sandy Loam	Poor: SHWT, Freq. Flood	Severe: SHWT, Freq. Flood	Severe: SHWT, Freq. Flood	Same	Same	Same	Freq. Flood
Chewacla Loam	Fair: SHWT, Freq. Flood	Severe: SHWT, Freq. Flood	Same	Same	Same	Same	Same
Coxville Loam	Poor: SHWT, Mod. Shrink-swell	Severe: SHWT, Ponding	Same	Same	Same	Same	SHWT, Mod. Shrink-swell
Goldsboro Loamy Sand	Fair: SHWT	Mod: SHWT	Mod: SHWT	Slight	Slight	Slight	SHWT
Johns Sandy Loam	Fair: SHWT	Severe: SHWT, Infreq. Flood	Severe: SHWT, Infreq. Flood	Same	Same	Same	Same
Kalmia Loamy Sand	Good	0-6% Slight 10-15% Mod. 15% & Severe	Same	Same	Same	Same	Infreq. Flood
Kenansville Loamy Sand	Good	Slight	Slight	Slight	Slight	Mod.	Gen. Favorable
Kinston Loam	Poor: SHWT, Freq. Flood	Same	Same	Same	Same	Same	Same
Lakeland Sand	Good w/ Binder	Slight	Slight-Severe: Low Filtering Action	Mod.: Poor Trafficability, Blowing	Same	Severe: Poor Trafficability, Blowing	Difficult to Load and Haul
Leaf Loam	Poor: SHWT High Shrink-swell	Severe: SHWT, Infreq. Flood	Severe: SHWT, Slow Perm., Infreq. Flood	Same	Same	Same	SHWT High/Shrink-swell Infreq. Flood
Leon Sand	Fair: SHWT	Severe: SHWT	Severe: SWHT, Low Filter Act.	Severe: SHWT, Poor Traff.	Severe: SHWT, Poor Traff.	Same	SHWT, Difficult to Load and Haul
Lynchburg Sandy Loam	Fair: SHWT	Severe: SHWT	Same	Same	Mod.; SHWT	Severe: SHWT	SHWT
Norfolk Loamy Sand	Fair-Good	0-6% Slight 6-10% Mod.	Same	Same	Same	0-2 Slight 2-6 Mod. 6+ Severe	Features
Rains Sandy Loam	Poor: SHWT	Severe: SHWT	Same	Same	Same	Same	Same
Rimini Sand	Good w/ Binder	Slight	Slight-Severe: Low Filter Act.	Severe: Poor Trafficability, Blowing	Same	Same	Difficult to Load and Haul
Troup Sand	Good w/ Binder	Slight	Slight	Mod.: Poor Traff., Blowing	Same	Severe: Poor Traff., Blowing	Difficult to Load and Haul
Wagram Loamy Sand	Good-Fair	0-6% Slight 6-15% Mod.	Same	Mod. Fair Traff., Blowing	Same	0-6% Mod. 6% & Severe	Features gen. Favorable
Wickham Loamy Sand	Fair-Good	Slight: Severe if Floods	Mod.: Severe if Floods	Slight: Severe if Floods	Same	0-2% Slight 2-6% Mod. Severe if Floods	Features gen. Favorable where no Flooding
Torhunta Loam	Poor: SHWT	Severe: SHWT, Infreq. Flood	Same	Same	Same	Same	Same

NOTE: SHWT stands for Seasonal High Water Table

DEVELOPMENT AND MANAGEMENT PLAN

Criteria for Resource Management and Program Development

Early in the planning study, public opinion was solicited for ideas relating to the improvement and expansion of the park. Two public meetings, were held — one prior to the development of plans and, later, one for review of plan alternatives. At the same time as the first public meeting, interviews were being conducted with Division staff and other individuals. Experts in the field of soil and water management, botany, zoology, archaeology, recreation, and park operations were consulted.

Emerging from these discussions were three issues of park development: long-term management of the Cliffs overlook area, repair and renovation of the existing picnic area, and general park expansion.

Cliffs/Overlook Area

It has previously been mentioned that the primary problem at the cliffs is the management of a resource which, by its nature, is quite fragile and which is undergoing increasing use and impact by park visitors. A great deal of attention is paid to this area by park staff to insure that misuse of the cliffs area is minimized. Nevertheless, the problem of park users climbing on the cliffs is apparent. Observation of this activity by park staff indicates that climbing up the cliff from its base occurs more frequently than climbing down from the overlook. The overlook serves as a destination for climbers by virtue of its siting lower on the cliff face.

The problem of erosion and sloughing off of the cliff is evidenced most visibly at the overlook. The current overlook was moved to its present location in 1975. Previously the overlook was located in a slightly lower position on the cliff and over a period of years the overlook structure had become badly undercut. As a result, safety of the structure became an issue in late 1974 and repair work began early in the following year. Since the completion of the new overlook, however, erosion at its base continues to be a problem.

The issue of cliff management becomes compounded with recognition of the significant increase in use resulting from improvements to the interpretive center. At present the center draws very little use due to the limited interpretive program and scant display material. However, detailed plans for improvements to the interpretive program have resulted in a contract being awarded for new displays and building renovations totalling approximately $115,000. It is projected that visitation of the interpretive center area, as a result of these improvements, will increase by 300 percent within the first three years following completion of the work. It is also expected that an equivalent increase in visitation will occur at the cliffs area generally affecting the overlook and related trail system.

Improving interpretive programs is a primary objective throughout the State Park system. Of greater importance, however, is the need to protect natural features, such as the cliffs, which form the basis for interpretive programs. What is required, therefore, is a management plan for the cliffs which serves to protect the cliffs from further abuse despite a significant increase in visitation. A secondary objective is to make the cliffs not only visible to the public but a more meaningful component of the interpretive program. In other words, any redesign of the overlook should enhance both cliff protection and its potential interpretation.

There are three direct ways of providing increased protection to the cliffs: by establishing more effective barriers to movement onto the steep slopes, by minimizing water runoff and structural contact with the slope, and by reducing the number of people in the area. The last mentioned method is likely to be unrealistic unless the complete removal of the overlook area is undertaken. Even if such a policy were approved it remains likely that use of the area would increase due to improvements occurring in the interpretive center.

Barriers to movement can range from fencing to the vertical separation of the overlook platform and ground level. Fences have the advantage of being relatively inexpensive and easy to install but are usually climbable and, if they are effective, probably are not attractive. Vertical separation, on the other hand, may be

more effective and attractive than fencing but also more expensive. Maximum control may be achieved through a combined use of these two measures.

Erosion caused by artificial structures (such as the overlook) can be reduced by limiting the points at which the structure meets the ground surface. This could mean either the elimination of the overlook or the design of an elevated and/or cantilevered structure. Control of erosion caused by water runoff can be accomplished through a number of measures. The primary objective, regardless of the specific measure, is diverting or slowing the movement of water nearest its source.

An important change that will occur relative to the cliffs is increased traffic and a change in the flow of pedestrian traffic. Presently, the great majority of visitors to the area move directly from the parking area to the overlook and return to the parking lot along the same path. Only minor volumes of traffic are directed to the interpretive center, usually on the return trip to the parking area. Similarly, relatively small numbers of people utilize the interpretive trails.

As a result of the improvements to the center, it is expected that a greater number of visitors will move from the parking area to the interpretive center then to the overlook. This movement sequence is desirable and should be reinforced. The purpose of the area, with respect to visitor use, is to provide park users with increased knowledge of natural and cultural history. It is desirable that the interpretive center be the first stop in the sequence of events since it is here that the visitor will be provided with the background necessary to gain a full appreciation of the cliffs and other aspects of the park. Visitors should be directed from the center to the cliffs. From this point, visitors should be provided the option of walking an interpretive trail or returning to the parking lot. Aside from establishing this order in pedestrian movement for the purpose of reinforcing the sequential learning experience, it is also desirable for reducing congestion at particular points.

Repair and Renovation of Existing Picnic Area

The picnic area at Cliffs of the Neuse has been located on its present site since 1947 and was developed to its current size in 1957. At that time the effort was to accommodate some 1,400 picnickers at one time. The area began to show signs of overuse in the early 1950's and the first timbers were laid to prevent soil erosion. Since that time the site has continued to undergo incremental repair. The main slope has been leveled in a series of plateaus with timber retainers. Picnic tables are located randomly across this slope and under the shelter, some supported on the downhill side by piles of rocks or stones. Soil erosion and compaction, however, are only secondary problems compared to the overall quality of environment.

The primary problem at the picnic area does not lie with the nature of the site but rather excessive densities and duration of use. Management procedures such as site rotation or existing site expansion to reduce densities have been impossible due to the lack of appropriate sites.

In order to alleviate this problem several needs must be met. First, the quantity of use must be distributed over a larger site so that more appropriate densities of use can be established. For family picnicking a desirable density is eight picnic tables per acre of land area. Group picnicking should be designed for a density of 12-16 tables per acre. Second, family and group facilities should be separated so that group programs do not interfere with the privacy of individual users. Third, a site must be selected which is not only suitable in terms of physical carrying capacity but also permits management programs such as site rotation to occur. Fourth, the provision of necessary services — water, toilets, convenient parking — must be available. Lastly, the

picnic area must maintain a close association with related activity areas including the swimming beach and boat dock.

While finding a new site for picnicking is a necessary long-term measure, of immediate importance is the renovation of the existing site. In order to carry out necessary repairs, interim measures are required. A temporary site for picnicking must be chosen while renovations are made. This temporary site must also meet needs of water supply, toilets, parking, and a close physical relationship to lake activities. It is likely that the existing site will need to be closed to all use for a period of two years while the area undergoes basic rehabilitation. This will include the removal of picnic tables and timber retainers, pulverizing and disking the site, fertilization, seeding, and fencing. Following these measures, the shelter may be reopened for light, controlled group use.

Park Expansion

The issue of park expansion is based on the conflicts of extending recreational development into areas of the park which have been managed in the past as park natural areas. From the first public meeting and interviews, there was expressed a general interest in improving the fishing and scope of overnight facilities in the park. Due to the lack of available land within the current use area the land east of the existing lake was investigated for expansion purposes.

Implicit in the desire for improved fishing in the park is the suggestion of a new lake specifically for that purpose. The present lake is not a fishing resource due to excessively acid water, and while the Neuse River is a good resource it is quite a different type of fishing than what could be provided in still water. Two potential dam sites were located and judged feasible by representatives of the Soil Conservation Service. Both sites were situated on the lower part of Still Creek, several hundred yards upstream from its confluence with Mill Creek. The first site would call for a dam about 30 feet in height, backing up slightly more than 10 acres of surface water. The second dam site was slightly lower in the watershed, would have required about a 40-foot tall dam, and backed up about 16 acres of surface water.

At the same time that lake feasibility was being studied, associated lakeside sites were investigated for their suitability for expanded overnight facilities including group camps and family cabin areas. The concept was that use of a new lake should be low-intensive and that some activities which required privacy and some degree of solitude could complement that atmosphere. Nevertheless, both dam sites were located in the area presently designated as park natural area.

Mill Creek was tested for water quality twice — first by the Wildlife Resources Commission and, second, by the N. C. Division of Water Quality. The first test indicated a pH of 6.5 while the latter showed a pH of less than 5.5. Due to these differences and the acidity of the water, it is questionable whether the water could support fish reproduction.

The proposals for lake development received only limited support at both the Division's in-house meeting and second public meeting. Considerable concern was expressed for the loss of the Mill Creek ravine system as a result of an impoundment and the probable impact of dam construction. Questions were also raised over the justification of such a great expenditure on the basis of improved fishing. A legitimate concern was also expressed over the loss of undeveloped land in what is presently a relatively small state park. As a result of these questions and the questionable water quality, it was determined that the development of a new lake was not appropriate. Rather, greater emphasis was placed on the preservation of remaining undeveloped land and the reinforcement of park natural area boundaries.

CLIFFS OF THE NEUSE STATE PARK

wayne county

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MASTER PLAN SYMBOLS KEY


PARK OFFICE


MAINTENANCE AREA

R RANGER RESIDENCE


PARKING


INFORMATION CENTER


FAMILY PICNIC AREA


GROUP PICNIC AREA


GROUP DAY USE AREA


SWIMMING


BOATING


INTERPRETIVE CENTER


AMPHITHEATER


TENT AND TRAILER CAMPING


FAMILY TENT CAMPING


GROUP TENT CAMPING


FAMILY WILDERNESS CAMPING


GROUP WILDERNESS CAMPING

Master Plan

The North Carolina State Park system has been established to preserve and protect the State's areas of unique or exceptional value, operate the parks to provide recreational use of natural resources in natural surroundings, interpret and portray natural features and processes within the parks, and preserve and protect scientific sites of statewide importance. The decision to establish this site as the Cliffs of the Neuse State Park was made long ago, and the park accomplishes all of the above objectives. However, through the years of extremely heavy use imposed on the park, the facilities have begun to reflect the amount of overuse and sheer numbers of park users, as discussed under existing conditions.

The Master Plan is a guide to both development and future management of the park, and must reflect changes in types of activities, amounts of use of both old and new activities, and recommended solutions for existing problems. Since the resource degradation of certain areas in the park is in a relatively advanced state, the first phase of the Master Plan deals for the most part with suggestions for renovation or redesign of the areas posing the most immediate problems. After these conditions are corrected, the Master Plan recommends provision of additional recreation facilities in two successive phases. Through careful examination of site limitations and constraints during the planning process, this method of development allows establishment of needed recreation facilities while retaining overall site integrity.

The park Natural Area shown on the Master Plan will ensure preservation of the most significant natural and physical features within the park. Activities within this 375-acre area will be limited to hiking trails and interpretive activities, and a small amount of wilderness camping.

Phase One

The first phase of development includes the projects currently in progress at the park and those additional projects necessary to correct current problems being encountered. The

Cliffs of the Neuse Interpretive Center is being remodeled and expanded to include a very comprehensive system of displays and exhibits. This series of displays will not be a static arrangement of fossils and artifacts, but rather, a dynamic arrangement of various presentation techniques including audio-visual equipment, graphics, scale model reproductions, preserved zoological and botanical specimens, and photographs. The center will be transformed into a useful interpretive tool, displaying the cultural and natural history and resources present in the park.

The interpretive center will become the hub of an expanded interpretive program within the park, and include facilities for both daylight and night use of the various parts of the overall program. Daylight use facilities include the interpretive center, the overlook area, and the system of interpretive trails. Night use of the facilities will include guided nighttime tours and slide shows to be held in a new amphitheatre a few yards north of the interpretive center. The existing interpretive trails will be reworked and repaired as necessary to accommodate the increased use caused by expansion of the interpretive program. The trails that now exist are not well marked and there are no signs along the path to give the park visitor information about the various natural features by the trailside. These trails will be reconstructed and realigned where necessary, and a comprehensive signing system implemented to give the visitor a self-guided tour through and past the significant natural features along that particular alignment.

At least one new trail will be added to the system during this phase. It will branch away from the existing Spanish Moss Trail and travel approximately one-half mile to the xeric coarse sand vegetation community. This vegetation community is one of the most unusual areas in the park, and is a valuable addition to the interpretive program.

The increased use of the interpretive center/cliffs area will necessitate an overall redesign of the access and pedestrian traffic system at the cliffs. Currently, the main access paths run from the parking lot straight to the cliff face and overlook. With the addition of the museum exhibits, there will be an attempt to redirect this traffic pattern, guiding the user toward the interpretive center from the parking area and then, after the tour through the interpretive displays, directing visitors toward the interpretive trails and the cliffs area.

This redesign will reduce the existing emphasis on direct parking-to-overlook access, and will change the access focus toward the interpretive center. New walkways, screen planting and directional signs will be used to encourage use of the interpretive program in the building before direct access to the cliff. This will tend to inform the park visitor of the formation process responsible for the existence of the cliff and instill a feeling for the fragile nature of the area.

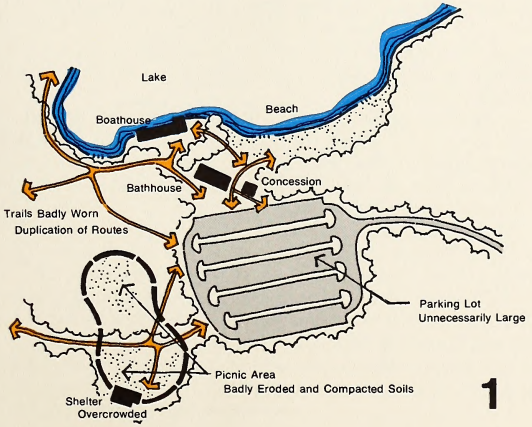
The increased emphasis on the expanded interpretive facilities will create the need for expansion of other related services, including the park information system. Currently, information is available at the park office, but the location of the office works better for administration than for providing information. As mentioned earlier, most of the park use centers around the picnicking and swimming areas, with the tent and trailer camping area and the hiking trails following closely. Most of these users bypass the park office completely, taking the most direct route to the desired activity.

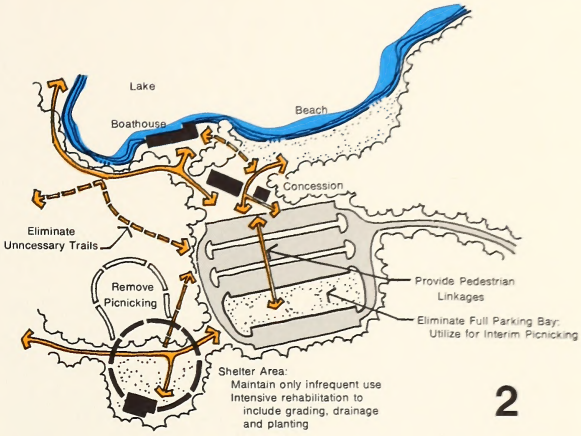
To correct this situation and help direct future park users to newly developed areas, it is desirable to move the information services to a location highly accessible to the park visitor. This facility would be most effective located inside the park gate and between the gate and the first turnoff or intersection. This short stretch of road carries the most traffic of any road section in the park, so the information station will be constructed on the south side of the road. This station will be a small shelter facility where a location and direction map will be posted, along with trail brochures, current events within the park, and descriptions of the available recreation activities. A small, eight-car parking area will be provided slightly off the main park road. Moving the information services to this location will enable concentration of the ad-

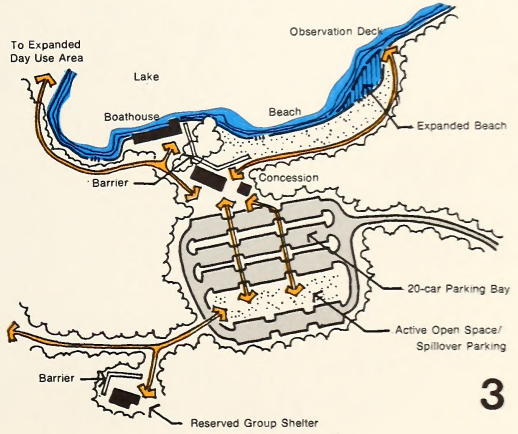
ministration functions of the park at the park office, and by reducing the number of people coming to the office for information, will increase protection of the maintenance area.

As mentioned earlier, the existing picnic area has sustained a large amount of use over a considerable length of time, and, is the heaviest use area in the park. Over 37 percent of the total park use is concentrated in the small land area around the picnic shelter, causing compaction of the soil, disappearance of all undergrowth vegetation, resulting in long-term soil erosion and giving the area an overused appearance. To correct this situation, it will be necessary to initiate a total renovation program covering the entire existing picnic and shelter area.

Two major actions will be required: first, removal of about 120 unused parking spaces in the large parking area and transformation of approximately 80 of these spaces (or one parking bay) into a new picnicking area, and secondly, removal of all picnicking other than that continuing in the shelter and renovation of the damaged area. The first action will require removal of the







asphalt parking spaces involved, aeration of the subsoil, bringing in additional topsoil, grading the new ground surface for drainage and privacy, and seeding of grass along with indigenous plant species in the newly created natural spaces. The parking bay which will be changed into a new open space will be the next to westernmost bay, and contains about 80 parking spaces. The remaining 60 spaces will be removed in groups of two or three adjacent spaces from the remaining four parking bays. These newly planted spaces will be designed and placed to guide park users from the picnicking area to the bathhouse and swimming area, as well as serving to break up the linear expanses of paved parking area.

As soon as the former parking bay has been transformed into usable open space, the picnic tables from the existing area will be moved to this new picnicking area. The only picnicking to continue in the existing area will be confined to the picnic shelter. Access to the shelter and toilet buildings will be reworked to keep park visitors out of the areas to be repaired and revegetated. Use of the shelter will be confined to under the roof and within a new hard-surface patio area about ten feet wide around the open side of the shelter. The timbers which have been placed across the damaged area through the years will be removed and the soil aerated to reduce the compaction. New topsoil will be brought in to re-establish the original land contours as close as possible, and the entire area will be graded to control run-off and prevent soil erosion. Indigenous plant species will be planted to restore

the destroyed understory vegetation, and the entire area will be grassed to help reduce erosion while the site is being renovated. The shelter will be used only on a group-reserved basis, and family picnicking will be allowed only in the newly established picnicking area.

The lake recreation area will continue to provide wading, swimming and boat rentals, as well as the sunbathing beach, bathhouse and concession building. The diving platform and beach area will be protected by lifeguards, and all appropriate safety equipment will be provided as it is presently. The tent and trailer camping area will remain as it is with no expansion, because the existing 35 campsites serve all the use demands placed on them. The primitive camping area north of the major activities will remain, also, and will be available for use by either families or groups. In the past, users were allowed to use an existing roadway off park property to get to the primitive camping area, but this access has been discontinued by the private owner. If some kind of access agreement is not negotiated to allow park staff emergency and maintenance to this area, the camp will either have to become hike-in camping only or be closed altogether.

Picnic Area Rehabilitation

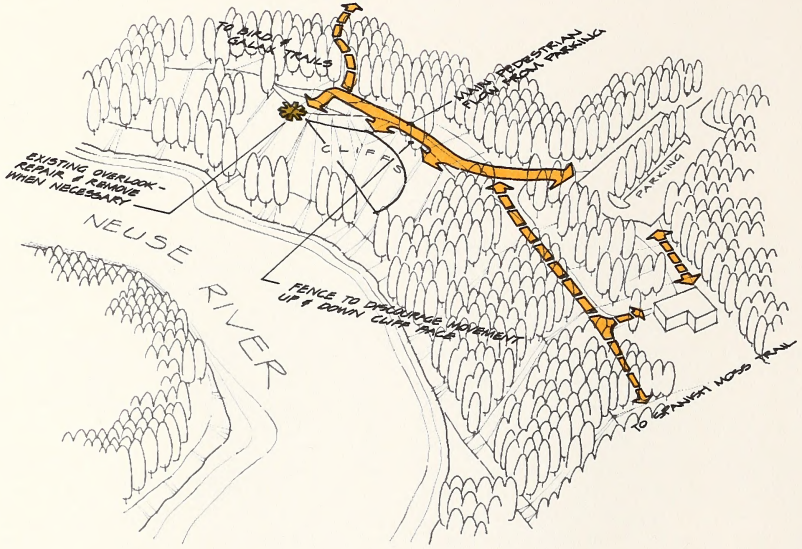
The rehabilitation of the existing picnic area will involve two stages. A full bay of parking will be converted to a grass surface and utilized for picnicking while the existing picnic area is closed. Non-essential or duplicate hiking trails will be identified and eliminated. A strong emphasis will be placed on pedestrian paths which will link the swimming and picnic areas across the main parking lot. The swimming beach will be expanded and a new walkway will be added which parallels the beach.

When the rehabilitation of the picnic area is complete, it will be designated as a group day use area available on a reservation basis. Family picnicking will be transferred to the new, permanent site opposite the lake and the converted parking bay will be used for permanent open space and overflow parking.

During this phase only a minimum of land acquisition will be necessary, but it is considered the first priority. It will be limited to acquiring one small holding of just over two acres north of the maintenance area, and another 15-acre parcel along S.R. 1742 south of the park gate. These lands are essential to allow the further development of the park in the next two phases.

Phase Two

The second phase of the Master Plan involves the first development of actual new facilities. Most of the "repair duties" are to be completed before this next stage is begun. The major thrust of this phase is the provision of new day use facilities on the south side of the existing recreation lake. This will entail construction of a new access road, a new group picnicking area, a new family picnicking area, and a new ranger residence. In addition, a new interpretive trail and access will be made across the river and a commitment on management of the cliffs/overlook area will be necessary.

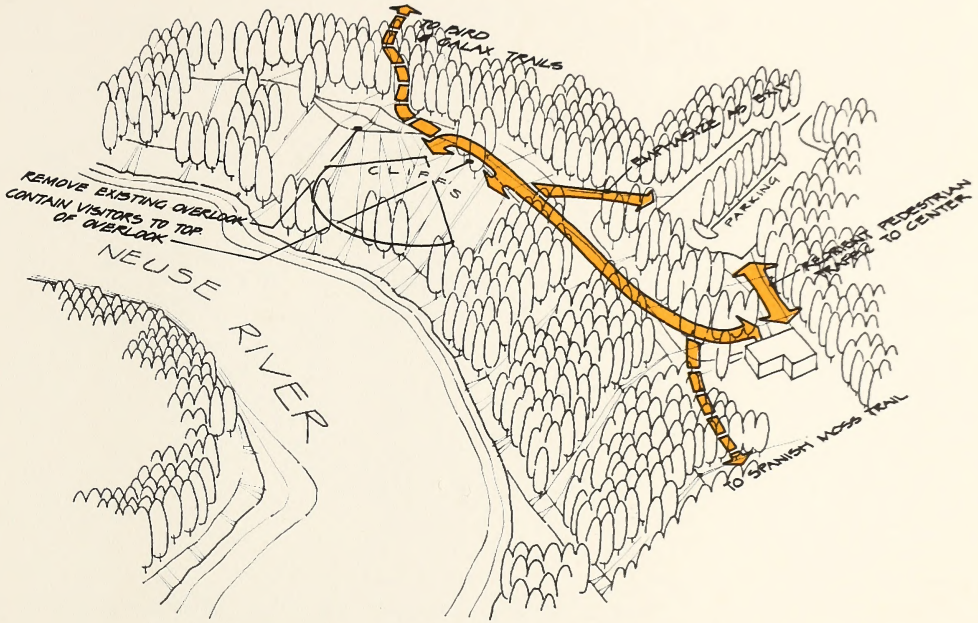


Cliffs Management Policy

Based on the analysis and criteria set forth earlier for the cliffs/overlook area, four alternative solutions have been developed. Given the present condition of the area, it is expected that deterioration of the site will continue and in fact increase at a more rapid pace over the next five years. It is strongly recommended that a policy decision regarding the cliffs be made early in Phase Two or by 1982. Furthermore, it is recommended that Alternatives Three and Four be given highest priority despite greater cost. Of the four solutions, only these two would both protect the cliffs and enhance their interpretation.

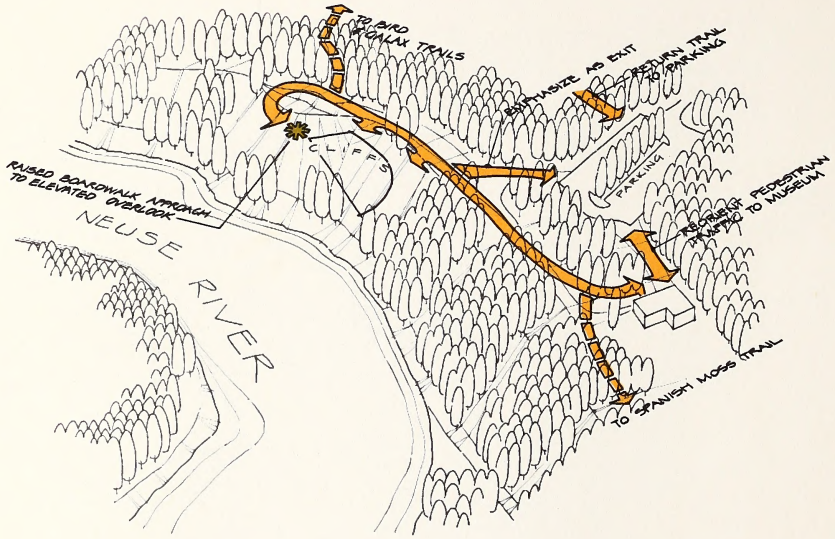
Alternative One

The first alternative suggests that the current policy of ongoing repairs to the present overlook be continued. Given this course of action it is expected that the overlook structure would require removal in 7-10 years. This policy, therefore, provides for interim use of the present facility but its eventual abandonment will probably be necessary despite the addition of planned fencing aimed at curbing undesirable pedestrian movement. The life of the overlook could most likely be extended if additional erosion control measures were taken.



Alternative Two

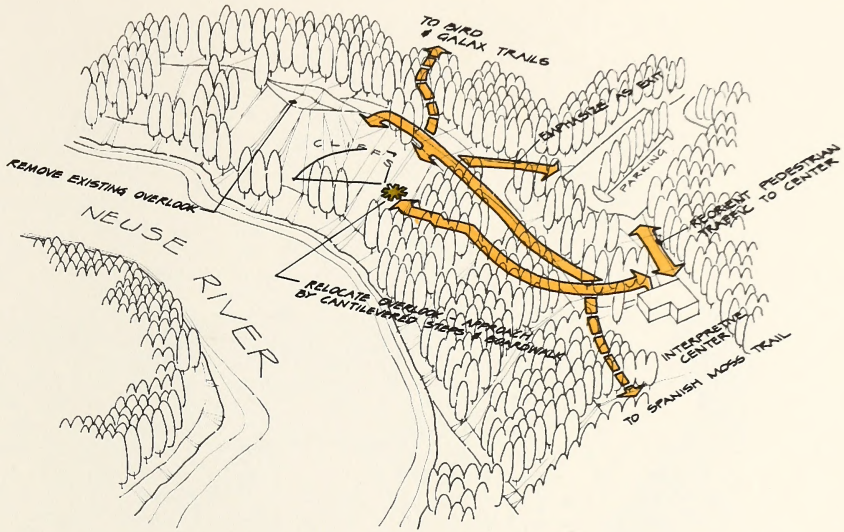
Removal of the overlook is proposed in this alternative. The basis for this approach is the need to protect the natural feature and the likelihood that elimination of the overlook and strict control of pedestrian traffic may accomplish this expeditiously. Pedestrian movement would be contained to the top of the cliff and the overlook site rehabilitated to prevent further erosion. The sequence of pedestrian movement would be altered to reflect the increased importance of the interpretive center. While elimination of the overlook would solve that particular problem, park visitors would be left without a direct view of the cliff face. A more distant but impressive view of the cliffs may be seen from the edge of the river near the proposed river crossing. If this alternative is chosen, this vantage point could deliberately be incorporated into the new River East Trail, which is discussed in another section.



Alternative Three

In an attempt to provide the needed protection for the cliffs and an increased value for direct observation, Alternative Three suggests a relocation of the overlook. The present structure would be removed including the approach steps. At the point where the present set of steps begins its descent, a boardwalk would instead begin a sweeping curve behind the current overlook site, maintaining a constant elevation. As the boardwalk curves toward the cliffs it will be elevated three to four feet above ground level. The overlook would be contained on a raised platform, slightly lower in elevation than the present site. The primary advantage of this proposal is the vertical separation of the approach and observation platform and limited contact with the ground surface. The location of the observation platform would also provide a superior vantage point to that of the present overlook.

Implied in this proposal is the need for a more sophisticated structure requiring a cantilever or similar means of support. Properly designed, the use of concrete and steel materials is not viewed as inappropriate to the site and in fact may be more appealing visually than the existing wood structure. Prior to a commitment, detailed engineering and design studies will be required.



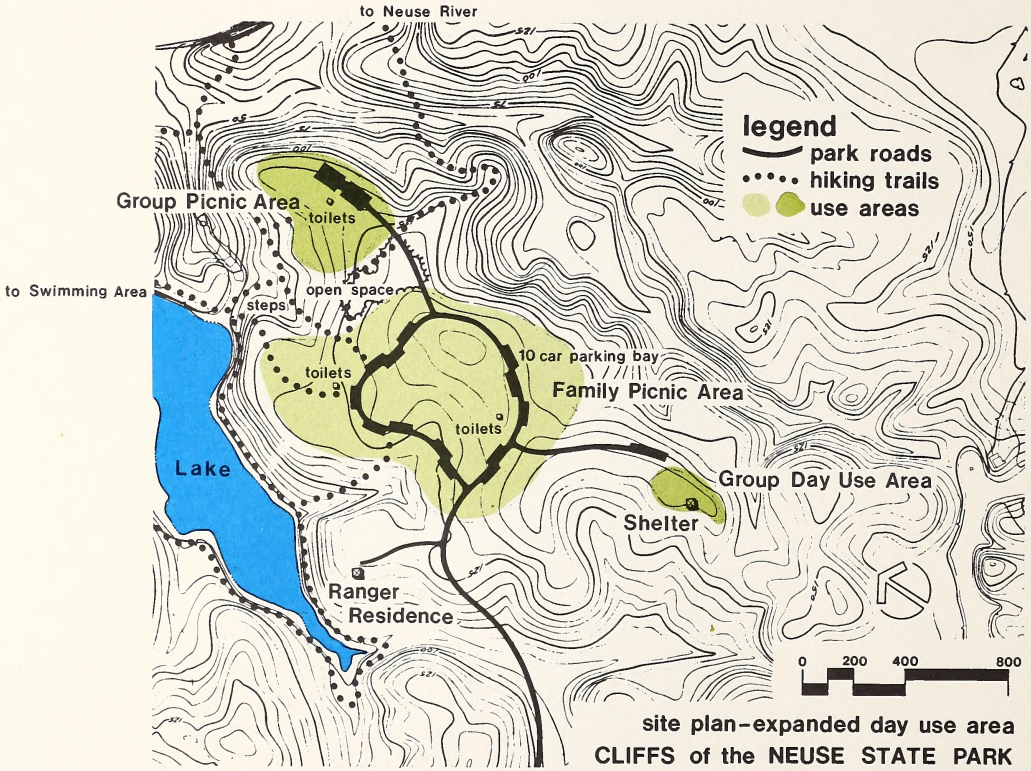
Alternative Four

The last alternative also suggests removing the existing overlook and providing a new observation site. However, in this proposal visitors are directed from the interpretive center to a boardwalk trail which begins immediately north of the building. The boardwalk would descend the cliff and approach an elevated observation platform along a series of steps cantilevered or otherwise skirting the steep slope. The observation platform would be located approximately halfway down the slope at the edge of the wooded portion of the cliff. Of the four alternatives, this location would provide the best view of the cliff and the least intrusive observation platform.

(phase two, continued)

The information facility constructed in the first phase takes on added importance when the construction of Phase Two is begun. It will be heavily relied upon to inform the public about the new location of the picnicking areas, for example. An even more comprehensive and expanded signing system will be needed to eliminate the confusion which automatically follows removal and relocation of recreation activities.

The access road to the new day use area will originate at the middle of the road section to the picnicking/swimming area parking lot, and will follow the slopes around the western end of the



site plan–expanded day use area
CLIFFS of the NEUSE STATE PARK

lake to the large ridge south of the recreation lake. It will be designed for two-way traffic and will be about 1.3 miles in length.

The new ranger residence will be located on a small knoll between the road and the lake, about two-thirds of the way to the end of the road. This location was chosen because of its proximity to the new use area and the desire to provide as much protection for the park land and facilities as possible.

The next activity area encountered along this road will be the new family picnicking area. This area will contain approximately 104 picnic tables with grills and trash receptacles, along with parking and a toilet building. The tables will be spread among the existing mature trees and understory vegetation over about 13 acres, representing a density of eight tables per acre or about 75 feet between tables. The access road will form a complete loop with a toilet building at its center and the picnic tables spaced evenly on both sides of the roadway. Parking will be provided in small paved pulloffs of no more than ten spaces each, and will be arranged for maximum ease of access to the associated picnic tables.

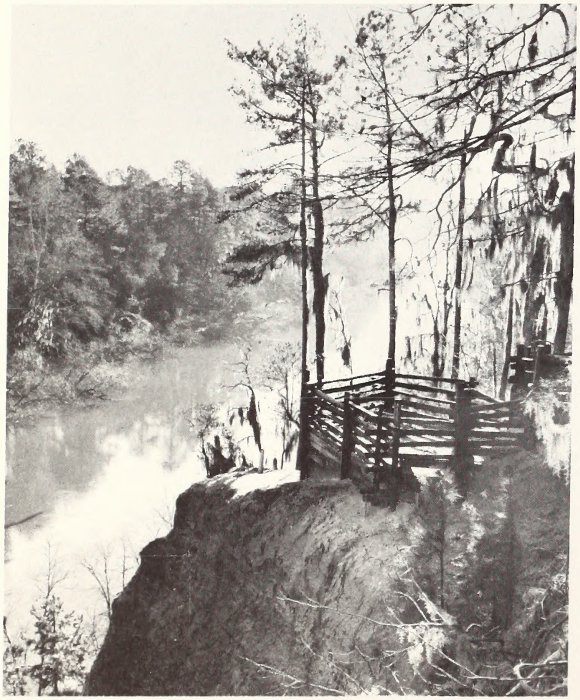
There will be no increase in the number of picnic tables now provided unless future demand increases significantly. To accomplish this goal, the picnic tables moved to the newly constructed picnic area in Phase One will be removed from that site and placed in the new family picnicking area. The former picnic area will then be used as open play space for the group shelter and swimming areas, in addition to being available for use as an overflow parking area when necessary.

New trails will be developed between the family picnicking area and the lake recreation area. These trails will allow those users wanting to go picnicking and swimming without moving their vehicles to do so easily and on well marked scenic trails. Trails will be routed both around the upper end of the lake for those wishing a longer walk and over the dam for those wishing to get directly to the bathhouse and the swimming area.

The access road will continue a short distance past the family picnicking area and terminate in a small, 40-car parking area which will serve the group picnicking area. Two 60-person groups will be able to picnic in this area at the same time. Complete facilities will be provided for the groups, including 15 picnic tables each, grills or fireplaces, trash receptacles, areas available for play activities, and a toilet building. The groups will also be provided quick access to the swimming area through new trails linking activity sites. The area required for these group activities will be no larger than five acres, and will be buffered from the other activities by distance and natural vegetation.

This phase will also involve further expansion of the interpretive program, including a new interpretive trail, the River East Trail, which will be located on the park-owned land on the east side of the Neuse River across from the cliffs. Access to this area will be across the river, only on a guided tour, and will involve some type of flexible method of river crossing. Two possibilities for this crossing include a cable ferry crossing and a short canoe trip. No bridges or permanent structures will be constructed to cross the river. Once on the east side of the river, the visitor will be guided along a three-quarter mile loop trail system through the various vegetation communities. Due to the periodic flooding of this land and the constant wet nature of the sloughs, a large part of the trail will be along elevated boardwalks.

In order to further protect the riverside vegetation and to preserve the view across the river from the top of the cliffs, additional land acquisition is recommended. The intent of this acquisition is to further protect the park's natural character, assuring that the stretch of river running through the park remain in its natural state and be used for natural interpretation purposes. Acquisition on the east side of the river necessary to fulfill this goal would involve a wooded strip about 500 feet wide both above and below the current state-owned parcel; this acquisition would total approximately 87.5 acres. Additionally, about 30.5 acres immediately north of the existing park boundary on the west side of the river is necessary to provide needed vegetative buffer for the primitive camping area and preserve the natural, isolated camping experience.



Phase Three

The third phase of the Master Plan involves projects both on the south side and the north side of the park. On the south side, accessible from the access road built in Phase Two, another group activity area will be built.

This facility will be more directly oriented toward providing an area that can be used by organized groups, such as schools and churches, to study the environment by using the park. A new spur road about 1,200 feet long will turn off the new access road between the ranger's residence and the family picnicking area and will terminate in a parking area for approximately 21 vehicles. An enclosed shelter, suitable for use in all types of weather and both day and night, will be built a short walking distance from the parking area. The shelter will provide usable space for groups no larger than 60 persons. Water and toilets will be available here, as will about 15 picnic tables and necessary grills for cooking, if desired. The trail system in the park will be extended to this facility so that the remainder of the interpretive system can be reached by foot.

Also on the south side of the park, the trails along the Neuse River bluffs will be extended downstream; approximately one mile down this trail, a wilderness camping area will be designated. Only five sites will be established, at a density of approximately one per acre, and all public access will be by foot. Parking will be provided in the existing parking areas in the park. As on the other side of the park, an access agreement to allow emergency and maintenance access to this area will have to be negotiated with the owner of the existing farm road. This service access agreement will involve less than three-quarters of a mile of access rights around the edge of an agricultural field, and will be necessary in order to service this camping area.

On the north side of the park, a new road will be constructed westward from the road to the tent and trailer camping area. This road will be about 1,200 feet long, terminating in a 21-car parking area. From this point, both families and organized groups will walk a short distance to the available tent campsites. The family and group tent camping area, although separated from each other by a buffer zone, will still be contained in this general location. Each campsite will be provided with a tent pad, picnic table, grill and trash receptacle. The six-family campsites will be spaced well apart, with no site within 200 feet of another. The 15 group campsites will be closer together, about 75 feet apart, but will still provide necessary privacy. These 15 sites will be sufficient to allow a group of about 50 people to camp in an uncrowded, natural environment. Water and toilet facilities will be provided by a centrally located washhouse for both family and group campers.

The final land acquisition involves approximately 107 acres of land. This lowest priority acquisition should be acquired only after all the higher priority lands are bought, and then only if the present character of the parcels is to be changed.

Two acres of timberland remain on the southwest corner of the intersection of S.R. 1742 and S.R. 1743. This small parcel should be acquired in order to protect the visual quality of the park entrance area. Approximately 105 acres of forested land between the southern park boundary and the agricultural fields should also be purchased due to the same vegetational characteristics that helped precipitate the original park land purchase. This area would be valuable to the park, because of its nature as a buffer and because of its possible use as an expanded environmental education area closely related to the new group day use enclosed shelter.

Summary of Development Phasing

Phase I
- Land Acquisition — 17 acres
  Obtain access agreement to existing primitive camp
- Complete remodeling of Interpretive Center
- Rehabilitation/reconstruction of main trails; implement comprehensive signing system
- Develop Sand Ridge Trail
- Implement redesign of Interpretive Center pedestrian traffic system and site landscaping
- Construct Park Information Station
- Rehabilitation/reconstruction of existing picnic area
- Repair cliff overlook as necessary

Phase II
- Land Acquisition — 118 acres
- Construction of access road to new day use area
- Construct ranger residence
- Develop family picnic area
- Develop group picnic area
- Construct related trail system
- Develop river crossing and River East Trail
- Policy decision on overlook management; begin necessary construction activities

Phase III
- Land Acquisition — 107 acres
  Obtain access agreement to new primitive camp
- Develop group activity area; extend trail system as necessary
- Develop Family Primitive Camp
- Construct access road, family and group tent camps

Development Program

		Turnover Rate	People per day	Parking
Day Uses				
I. Interpretive Center		8	480	
museum/display building (existing)				
amphitheatre				
interpretive trails				
overlook				
parking (existing)	total			100 (4)
II. Lake Recreation Area (existing)				
boating - 17 rental rowboats, boathouse		8	340	12
swimming		2	2000	188 (4)
bathhouse				
concession building				
beach-wading and diving platform				
parking	total			200 (4)
III. Group Day Use Area - Reserved		2	120	15 (2)
shelter (existing)				
20 picnic tables				
toilet buildings (existing)				
parking (existing)	total			15 (2)
IV. Group Picnicking Area		2		
(2) 60-person groups			240	40 (2)
15 tables/group - 1 acre				
open space - 1 acre				
toilet buildings				
parking	total			40 (2)

		Turnover Rate	People per day	Parking
V. Family Picnicking Area		2		
13 acres-8 tables/acre-104 tables			832	
4 people/table				
toilet buildings				
parking	total			104 (4)
VI. Group Day Use Area — Reserved		2		
enclosed shelter—				
(1) 60-person group			120	
15 picnic tables				
toilet facilities				
parking	total			15 (2)
VII. Interpretive Trails				
(use season - 270 days)		6		
Bird Trail	.75 mile		60	
Galax Trail	.5 mile		40	
Spanish Moss Trail	.5 mile		40	
River Crossing & Trail	.75 mile		60	
Sandridge Trail	.5 mile		40	
total	3 miles		240	
VIII. Natural Area	375 acres			
IX. New Access Road	7000 lin. feet = 1.3 miles			

	Turnover Rate	People per day	Parking
Overnight Uses			
I. Tent and Trail Camping Area (existing)	1		
35 campsites		140	
washhouse			
II. Tent Camping Area	1		15
Family and Group tent camping			
Family - 6 acres, 6 sites		24	6
Group - 5 acres, 15 sites		60	15 (1)
Washhouse - centrally located			
New access road - 1200 lin. feet = .23 mile			
Parking total			21 (1)
III. Primitive Camping Area	1		
Family - 5 sites @ 1 site/acre		20	5
or			
Group - 16 sites @ 8 sites/acre		64	16 (1)
toilet facilities			
water - hand pump and well			
parking - Interpretive Center parking lot			
IV. Wilderness Camping Area	1		
5 sites @ 1 site/acre		15	
pit toilets			
parking - in existing parking lots			5
V. Access Agreements			
necessary for maintenance and emergency access to Primitive Camping Area along existing roadway-.91 mile			
necessary for maintenance and emergency access to Wilderness Camping Area along existing roadway-.62 mile			

	Turnover Rate	People per day	Parking
Service Facilities			
I. Park Office (existing)			
administration			
permits			
parking			6
II. Maintenance Area (existing)			
shop building			
warehouse building			
personnel barracks			
III. Information Station	30	720	
location and direction information			
parking			8 (2)
IV. Ranger Residences			
3 existing			
1 proposed			

Land Acquisition

Priority one	17.03 Acres
Priority two	118.00 Acres
Priority three	106.63 Acres
Total Acquisition	241.56 Acres

Services to Park Users

The programs currently practiced at Cliffs of the Neuse State Park and other parks, particularly those for visitor protection and law enforcement, will be continued and, where necessary, strengthened. The legal authority vested in park personnel is an effective means of controlling or eliminating misuse of the park, preventing unwanted encroachment upon the park land, and providing protection for the park visitors.

Park areas patrolled by uniformed personnel will include designated land use areas and roads, as well as the lengths of the hiking and interpretive trails, and areas of the park not intensively used. The park boundaries will be kept well marked and will be patrolled regularly to guard against encroachments, the development of new trails, undesirable uses, and so forth.

Mobile two-way radios provide communication in and around the park and will continue to be used. These radios operate on the same frequency as the N. C. Forest Service units so that in case of emergency the two agencies are in instant contact. This frequency should be monitored by the remaining law enforcement agencies within the area, particularly the Wayne County Sheriff's Department and the N. C. Highway Patrol.

The information station to be constructed just inside the main park entrance is an essential service. Visitors should be aware of the locations of park facilities and activities, trails, features and the various programs which are available. In addition, the design and location of the information station can help acquaint park visitors with park regulations and governing philosophy.

Orientation and information services will not be limited to this location, however. Other facilities will be placed around the park, particularly at the major use areas, but even the trails and access paths will be marked by a comprehensive sign system. Trail booklets and explanatory pamphlets will be available to show the hiking and interpretive trails, and will stress the delicate qualities of the various plants and habitats found along the trails. They will also inform the users that collecting or molesting any of the flora and fauna in the park is strictly prohibited, and the interesting items found throughout the park should remain as they are for enjoyment by all other park visitors.

Staffing

Additional manpower will be needed to augment existing staff, particularly for improvements to the interpretive program and proposed park expansion. One full-time, permanent park ranger position will be required during Phase Two when the expansion of day use facilities occurs. Two additional positions for seasonal park attendants are necessary during Phase One. These positions will serve increased use as a result of improvements to the interpretive center and construction of the new information facility. In addition to these positions, part-time labor support will be required on an ongoing basis as improvements, site repairs, and facility expansion occur.

Utilities

For existing park facilities, potable water is supplied by a single well with storage tank at the maintenance area. This system provides water to the office and maintenance area, tent and trailer campground washhouse, the interpretive center, toilet buildings at the picnic area, bathhouse facilities, as well as several drinking fountains. For these facilities, the supply and quality of water are adequate for both the present and foreseeable future.

The proposed expansion of park activities will necessitate a new well and storage tank located on the ridge southeast of the lake, in close proximity to the new day use facilities. As indicated by the accompanying table, the water system should be designed for use by nearly 1,300 people, or about 13,340 gallons per day.

Sewage disposal for existing use areas is handled almost exclusively by individual septic systems for each major facility.

This decentralized system has occurred due to the slow, incremental growth of park facilities and related demand for sewer service. As a result, there are presently nine separate septic systems in the park with only one serving more than one facility; the bathhouse, swimming area concession building, and picnic area toilet buildings are served by a single nitrification field. Maintenance and repair costs for these septic systems will increase in the future. Prior to major investments to renovate these systems, analysis should be made of the cost-benefit of maintaining the present system or converting to a single community-type sewer disposal system.

All new facilities proposed in the Master Plan, with the exception of primitive camps, require either toilet or washhouse facilities. These will create additional needs for more sophisticated means of sewage disposal, perhaps a centralized septic system, or will provide additional justification for the community-type system. Despite other cost considerations, whatever system is chosen should be easily maintained, well adapted to and protective of the park landscape, maintain a gravity flow system as much as possible, and maintain a level of service appropriate to the level of use.

Electrical service for the park is presently provided through underground installations. This policy should be continued for all new electrical service provided in the park. All transformers and switching facilities should be contained in low-profile enclosures, mounted above ground for easy access and maintenance. Underground cable connections, terminations or taps should be in manholes.

Right-of-ways or installations for all utilities should be controlled through hand digging and cutting. Multiple use of right-of-ways is desirable (for trails, roads, or general open space); however, they should be laid out carefully to avoid undesirable use and visual intrusion.

Utility Requirements for Expanded Day Use Area

Family Picnicking Area
- toilet buildings (2)
  - (men) 3 toilets, 2 urinals, 4 lavatories
  - (women) 4 toilets, 4 lavatories
- water 7.5 gal/person 832 people 6,240 gal/day
- electrical power required

Group Picnicking Area
- toilet building
  - (men) 2 toilets, 2 urinals, 3 lavatories
  - (women) 3 toilets, 2 lavatories
- water 7.5 gal/person 240 people 1,800 gal/day
- electrical power required

Group Enclosed Shelter
- toilets
  - (men) 2 toilets, 1 urinal, 2 lavatories
  - (women) 3 toilets, 2 lavatories
- water 7.5 gal/person 120 people 900 gal/day
- electrical power required

Ranger Residence
- water 50 gal/person 4 people 200 gal/day
- toilets, electrical power and telephone required

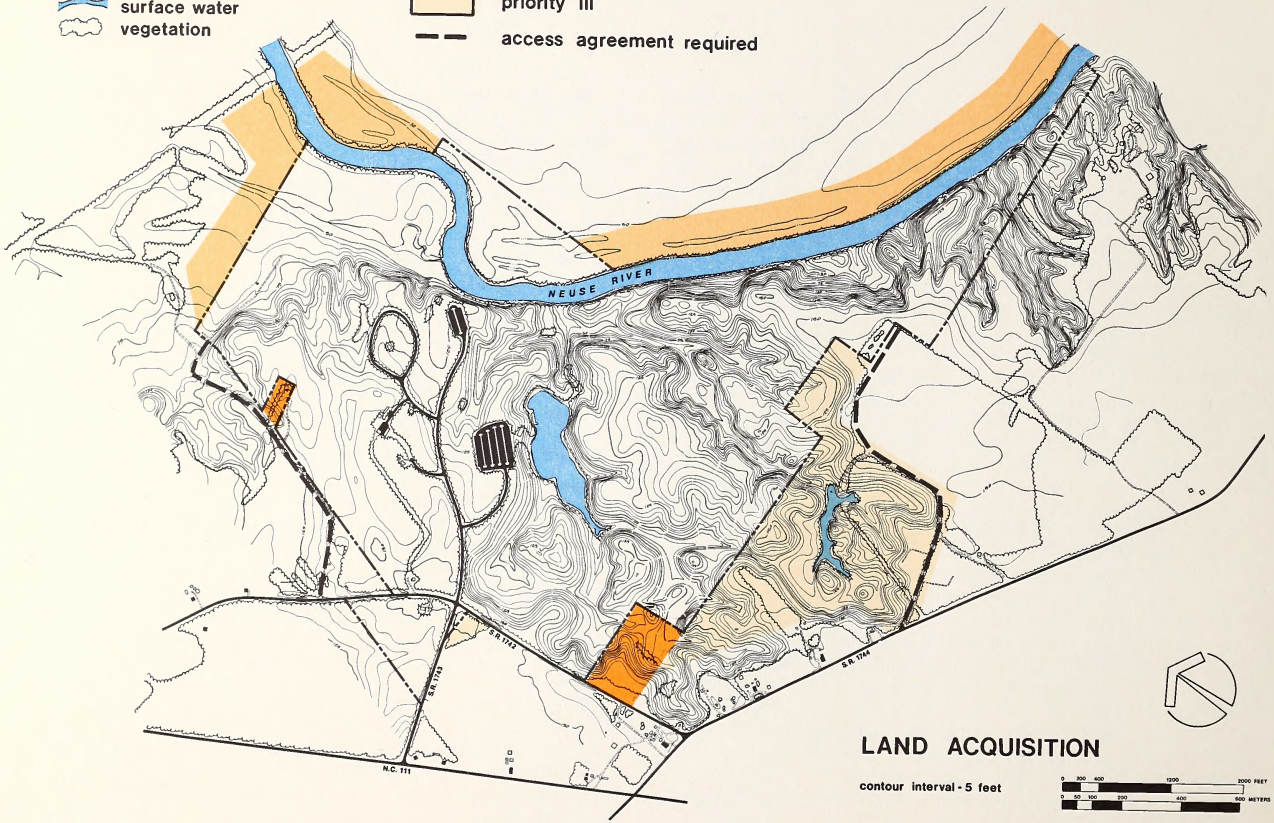
Family and Group Tent Camping Area
- washhouse
  - (men) 2 toilets, 1 urinal, 3 lavatories, 2 showers
  - (women) 3 toilets, 3 lavatories, 2 showers
- water 50 gal/person 84 people 4,200 gal/day
- electrical power required

LEGEND

- park boundary
- paved roads
- buildings
- dwellings
- surface water
- vegetation

land acquisition priorities

- priority I
- priority II
- priority III
- access agreement required



LAND ACQUISITION

contour interval - 5 feet

0 300 400 1200 2000 FEET
0 50 100 200 400 600 METERS

CLIFFS OF THE NEUSE STATE PARK

wayne county

north carolina

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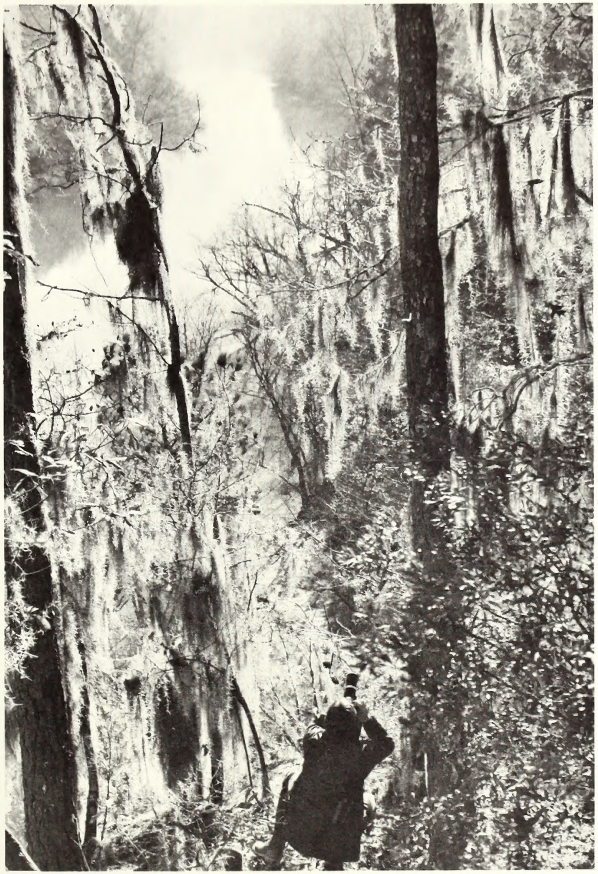

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